UTILIZATION OF ARTIFICIAL INTELLIGENCE (AI) TO DETECT ELEMENTS OF BULLYING IN THE SCHOOL AND CAMPUS ENVIRONMENT

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Abstract

Bullying is an unpleasant behavior that makes someone feel uncomfortable, hurt, and emotionally and psychologically distressed. One form of bullying that often goes undetected is verbal bullying, which is not directly visible but has a profound impact on the victim. This research aims to prevent verbal bullying by utilizing AI technology in campus and school environments. This research uses a qualitative method with a case study approach, which focuses on in-depth exploration of specific contexts and phenomena, allowing researchers to understand in detail how AI can detect verbal bullying. AI will be used to analyze conversations in the context of classes and other social interactions, with the ability to recognize language patterns containing elements of sarcasm, insults, or bullying behavior that are difficult for humans to see. While the technology is promising, a key challenge is the AI's ability to understand the nuances of human behavior, such as sarcasm or different cultural contexts, which can affect detection accuracy. In addition, the use of AI in these sensitive environments raises ethical issues related to privacy, which need to be carefully addressed. The data collection technique was conducted with a questionnaire given to 572 respondents consisting of students, teachers, lecturers, and education personnel in Sumedang Regency. The data analysis technique used the Miles and Huberman model, which includes three stages: data reduction, data presentation, and conclusion drawing. The results of the analysis show that the utilization of AI to detect verbal bullying in school and campus environments is very potential, but human supervision is still needed to verify the results of AI detection.
Keywords: bullying; artificial intelligence; education environment.

Abstrak

Permasalahan yang marak terjadi di lingkungan sekolah dan kampus yaitu perundungan (bullying) yang merupakan perilaku tidak menyenangkan yang membuat seseorang merasa tidak nyaman, sakit hati, dan tertekan secara emosional dan psikologis. Salah satu bentuk perundungan yang sering kali tidak terdeteksi adalah **bullying verbal**, yang tidak terlihat secara langsung namun memiliki dampak yang mendalam pada korban. Penelitian ini bertujuan untuk mencegah perundungan verbal dengan memanfaatkan teknologi AI di lingkungan kampus dan sekolah. Penelitian ini menggunakan metode kualitatif dengan pendekatan studi kasus, yang berfokus pada eksplorasi mendalam terhadap konteks dan fenomena tertentu, memungkinkan peneliti untuk memahami secara rinci bagaimana AI dapat mendeteksi verbal bullying. AI akan digunakan untuk menganalisis percakapan dalam konteks kelas dan interaksi sosial lainnya, dengan kemampuan untuk mengenali pola bahasa yang mengandung unsur sarkasme, penghinaan, atau perilaku intimidasi yang sulit dilihat oleh manusia. Meskipun teknologi ini menjanjikan, tantangan utama yang dihadapi adalah kemampuan AI dalam memahami nuansa perilaku manusia, seperti sarkasme atau konteks budaya yang berbeda, yang dapat memengaruhi akurasi deteksi. Selain itu, penggunaan AI di lingkungan sensitif ini memunculkan masalah etika terkait privasi, yang perlu diatasi dengan cermat. Teknik pengumpulan data dilakukan dengan kuesioner yang diberikan kepada 572 responden yang terdiri dari mahasiswa, guru, dosen, dan tenaga kependidikan di Kabupaten Sumedang. Teknik analisis data menggunakan model Miles dan Huberman, yang mencakup tiga tahap: reduksi data, penyajian data, dan penarikan kesimpulan. Hasil analisis menunjukkan bahwa pemanfaatan AI untuk mendeteksi verbal bullying di lingkungan sekolah dan kampus sangat potensial, tetapi pengawasan manusia tetap diperlukan untuk memverifikasi hasil deteksi AI.

Kata Kunci: perundungan; kecerdasan buatan; lingkungan pendidikan.

Introduction

Bullying is verbally, physically, or socially unpleasant behavior in the real or virtual world that makes someone feel uncomfortable, hurt and depressed whether carried out by individuals or groups (Kemendikbud, 2021). Bullying in educational settings, both in schools and campuses, is a serious problem that can affect the mental health, academic performance, and social well-being of students and college students (Saraswati & Hadiyono, 2020). An even more severe negative impact is that victims of bullying will experience depression and even suicidal thoughts.

The Indonesian Child Protection Commission (KPAI) stated that KPAI complaint data showed that child abuse in early 2024 had reached 141 cases (Putra, 2024). Of all the complaints, 35 percent of them occurred in the school environment or educational units. Throughout early 2024, there were 46 cases of children ending their lives. Of the total cases, 48 percent of them occurred in educational units or the child victims were still wearing school clothes. Bullying takes the form of demeaning, intimidating, and inflicting mental and physical suffering on weak victims because they (the perpetrators) feel that they have power over others (Rahmawati & Illa, 2020).

As stated in the law to ensure the welfare of every child for survival, growth and development and the right to protection from violence and discrimination that "Children in and within the education unit must receive protection from physical, psychological, sexual crimes, and other crimes committed by educators, education personnel, fellow students, and / or other parties" mandated in Law No. 35 of 2014 concerning Child Protection Pasal 54 Ayat 1 (Republik Indonesia, 2014). As well as, the implementation of Permendikbud No. 82 of 2015 concerning Prevention and Response to Violence in the Education Unit Environment.

Forms of bullying consist of verbal, physical, social, and cyber bullying (Panggabean et al., 2022). Verbal bullying is carried out by them (the perpetrators) in the form of insults, ridicule, slander, criticism, and remarks that lead to sexual harassment. Verbal bullying often goes undetected because it is not visible to the eye directly, leaves no physical evidence and is even considered part of normal social interaction (Ningrum, 2018). The consequences of bullying have an impact on the psychology of victims who are in the phase of self-identity development.

The educational environment is a place where bullying cases are often found, even though it should be a place that upholds positive values such as courtesy and respect for others (Warsono & Rahadian, 2024). With the increasing awareness of the importance of creating a safe and inclusive learning environment, there is a need to develop effective detection tools to identify bullying behavior quickly and accurately. One technology that can currently be used is artificial intelligence (AI) (Djamzuri & Mulyana, 2023). Relying on the ability of AI technology to detect language patterns that contain elements of verbal violence, intimidation, or bullying through automatic conversation analysis.

The utilization of AI in detecting bullying can help in identifying bullying cases early as a preventive measure (Rovida & Sasmini, 2024). It can be understood the importance of conducting research with the help of AI technology to detect bullying in verbal form. Thus,

this study aims to find out how the potential use of AI technology in detecting bullying elements in campus and school environments, as well as analyzing user perceptions of the effectiveness of the application of AI technology against verbal bullying. This research is expected to provide insight into the role of AI technology in creating a safer and more conducive educational environment.

Research Methods

This research uses a qualitative method with a study approach to present rich and in-depth results, opening new insights related to the phenomenon being studied. The selection of a qualitative approach was carried out because this research aims to obtain an understanding and explanation of complex and diverse phenomena from the point of view of the subjects involved (Sugiyono, 2022). This research was conducted in several elementary schools in Sumedang Regency and UPI Sumedang Campus. This research was conducted on teachers, students, lecturers, and education personnel who do play a role in the school and campus environment.

The data collection technique of this research is by giving questionnaires to students, teachers, lecturers, and education personnel. The questionnaire was used to obtain the views, perceptions, and direct experiences of the respondents involved in the study (Sugiyono, 2022). The questionnaire is in the form of questions that have been prepared previously. Respondents were selected based on research needs within the scope of schools and campuses and understand bullying. This technique is used to ensure that respondents have knowledge relevant to the research focus. Meanwhile, the data analysis technique follows the stages of the Miles and Huberman interactive analysis model, which consists of three steps, namely data reduction, data presentation, and conclusion drawing (Sugiyono, 2022).
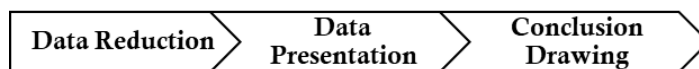

Figure 1. Data Analysis Technique

The data analysis technique based on the Miles and Huberman model presented in the figure above consists of three stages, namely data reduction, data presentation, and conclusion drawing. Data reduction was carried out on the data obtained and then selected the data needed, including the findings related to bullying which were submitted to the research subjects in a questionnaire. Furthermore, the data is presented in tabular form so that it is easy to understand. The final stage is drawing conclusions based on the data obtained to be able to answer the formulation of the problem that has been set.

The following questionnaire instrument that requires a rating scale in the study is shown in table 1.

Table 1. Instrument Statements

Statements
Do you agree that Artificial Intelligence (AI) is used to detect verbal bullying in school and college environments?
Would you feel comfortable if classroom conversations were monitored by AI to detect bullying?
Can AI accurately detect bullying sentences?
Can AI accurately distinguish between normal comments and bullying sentences?

Do you agree that AI can help prevent verbal bullying in schools and colleges?

Is AI technology effective in detecting verbal bullying compared to expert detection?

Will the application of AI technology for verbal bullying detection in educational environments have a positive impact on the atmosphere when carrying out the teaching and learning process?

On a scale of 1-5, how trustworthy are the results of AI detection of bullying sentences?

Then, the rating scale criteria for the statement are described as follows.

5 = Strongly Agree

4 = Agree

3 = Neutral

2 = Disagree

1 = Strongly Disagree

Results and Discussion

This research was conducted in a school environment and one of the campuses located in Sumedang Regency. The results in this study were obtained from analyzing questionnaires given individually to students, teachers, lecturers, and education personnel. Based on the results of the questionnaire analysis, there were a number of respondents with the following scattered categories.
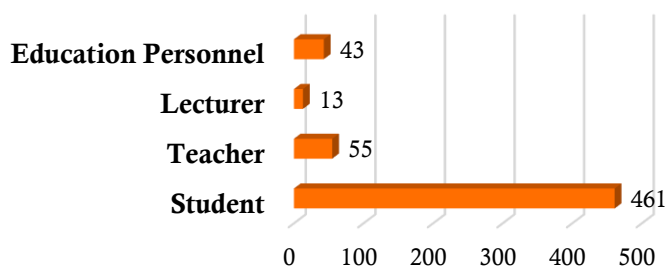
Figure 2. Category of Respondents

Based on the figure above, this study obtained through the analysis of questionnaires given individually to four groups of respondents, namely students, teachers, lecturers, and education personnel. The total respondents collected consisted of 461 students, 55 teachers, 13 lecturers, and 43 education personnel. Data from each group of respondents is used to get a comprehensive picture of the issue being studied (Sugiyono, 2022).

Based on the results of this study, there are findings related to the utilization of artificial intelligence (AI) technology for bullying detection in the school and campus environment as follows:
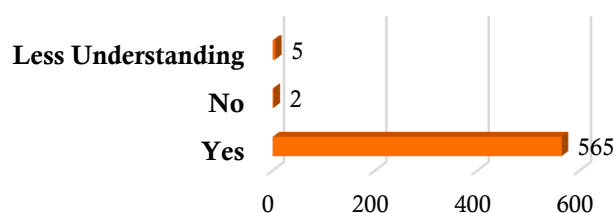
1. Understanding about bullying

Figure 3. Respondents' Understanding of Bullying

Based on the figure above, it shows that most respondents have a good understanding of bullying with 565 respondents (around 98%) answering "Yes" to a fairly good understanding of bullying. Meanwhile, only 2 respondents (0.3%) answered "No" and 5 respondents (0.9%) stated "Less Understanding".

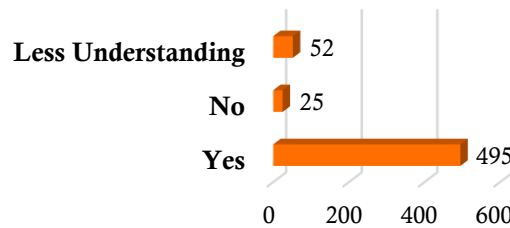2. Understanding of artificial intelligence (AI) technology

Figure 4. Respondents' Understanding of AI

Based on the questionnaire analysis, 495 respondents (88%) answered "Yes" indicating an understanding of AI. However, there were still 25 respondents (4%) who answered "No" and 52 respondents (8%) who stated "Less Understanding" This data shows that although most respondents have knowledge of AI, there are a number of respondents who still need further understanding of the technology.

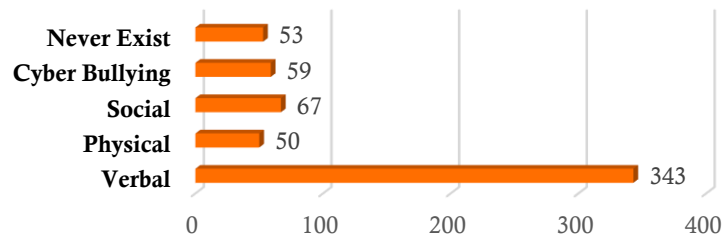3. The most common types of bullying in school and college environments

Figure 5. Types of Bullying

Based on the figure above, it shows that the type of bullying most commonly encountered in the school and campus environment is verbal bullying, with 343 respondents. This is followed by social bullying (67 respondents), cyberbullying (59 respondents), and physical bullying (50 respondents). However, there were 53 respondents who stated that they had never encountered or seen bullying in the school or campus environment. This data shows that verbal bullying is the most common form of bullying, thus the need for follow-up on verbal interactions in the educational environment (Damayanti et al., 2023).

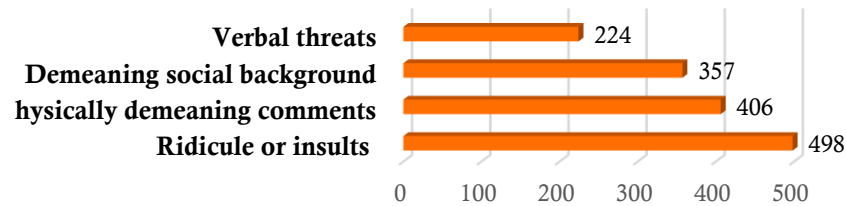4. Sentences that fall under the category of verbal bullying

Figure 6. Types of Verbal Bullying

Based on the results of the analysis, the most frequent sentences included in the verbal bullying category were taunts or insults, with a total of 498 respondents admitting that this happened in the school and campus environment. In addition, physically related demeaning comments were also frequently found with 406 respondents. Furthermore, bullying that denigrates social background reached 357 respondents, while verbal threats were reported by 224 respondents. This data shows that various forms of verbal bullying, especially teasing or humiliation, are very common and have an impact on the social environment in schools and campuses (Tari et al., 2024).
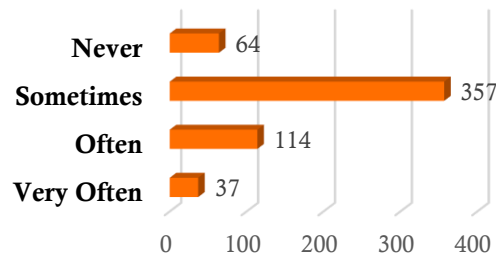
5. Verbal bullying cases in college and school settings

Figure 7. Frequency of Bullying

Based on this data, it shows that cases of verbal bullying in the campus and school environment occur quite frequently, even though it does not involve them directly as victims or perpetrators. A total of 357 respondents reported that they "Sometimes" encountered cases of verbal bullying around them. Meanwhile, 114 respondents stated that they "Often" encountered cases of verbal bullying, with 37 respondents reporting "Very Often." In contrast, only 64 respondents stated that there were "Never" cases of verbal bullying around them.

6. The use of Artificial Intelligence (AI) technology in school and campus environments
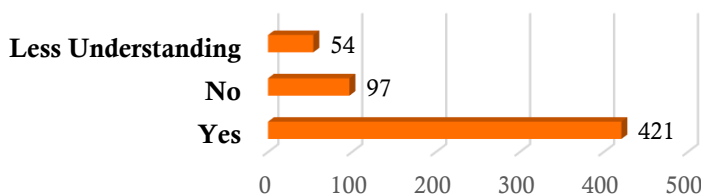
Figure 8. The Use of Artificial Intelligence in School and Campus Environments

Based on the figure above regarding the use of Artificial Intelligence (AI) technology in the school and campus environment, it shows that most respondents, namely 421 people, have used AI technology in the educational environment. However, there are still 97 respondents who have not utilized AI technology and 54 respondents who claim to lack understanding of the use of AI in the educational environment. This finding shows that AI utilization is already quite widespread, but there is a need to increase understanding of AI technology so that it can be utilized more optimally in schools and campuses.

Further data analysis on the use of Artificial Intelligence (AI) technology to detect verbal bullying in college and school environments with the help of 5 rating scales. The analysis includes respondents' views on the effectiveness of AI in detecting and preventing verbal bullying which is presented in table 2.

Table 2. Data Respondent's

No	Statements	SA	A	N	D	SD
1.	Artificial Intelligence (AI) used to detect verbal bullying in school and college environments	191	191	142	25	23
2.	Feel comfortable if classroom conversations are monitored by AI technology to detect bullying	95	131	229	73	44
3.	Accurately detect bullying sentences	66	157	277	56	16
4.	AI technology can accurately distinguish between normal comments and bullying sentences	55	155	275	72	15
5.	AI technology can help prevent verbal bullying in the campus/school environment	87	182	240	51	12
6.	AI technology is effective in detecting verbal bullying compared to expert detection.	32	122	302	87	29
7.	The application of AI technology for verbal bullying detection in the educational environment will have a positive impact on the atmosphere when carrying out the teaching and learning process.	90	187	247	40	8
8.	On a scale of 1-5, how much confidence do you have in the results of AI detection of sentences containing bullying elements	42	168	307	47	8

Based on the results of the analysis, the majority of respondents support the use of AI technology to detect verbal bullying in school and campus environments. However, their comfort level with AI monitoring conversations varied. Many respondents were uncomfortable with classroom conversations being monitored, possibly due to privacy concerns. In addition, some respondents still doubted AI's ability to accurately detect bullying, especially in distinguishing between normal comments and bullying words. Nonetheless, the majority of respondents believe that the use of AI can help prevent verbal bullying and have a positive impact on the learning atmosphere in educational settings.

Furthermore, there are a number of steps that should be taken by schools and campuses to support the implementation of AI technology in detecting bullying. Some of these steps include; provision of adequate technology, schools and campuses should ensure a stable internet network and computers or servers that support AI operations (Djamzuri & Mulyana, 2023); training, schools and campuses need to provide training to teachers, staff, and students on how this AI technology works (Rahim & Suyitno, 2024). This training aims to understand the function of AI detection of signs of bullying and to know the responsive steps to be taken; data privacy and security policy, as AI will process sensitive data, such as student conversations or behavior, it is necessary to maintain data privacy and security and ensure the data is only used for bullying detection purposes (Sidik, 2024); follow-up, After bullying is detected, schools and campuses need to have clear disciplinary policies, such as counseling, warnings, or other disciplinary actions according to applicable policies (Setiawan & Saputra, 2024). This ensures that AI technology functions not only for detection, but also effectively in preventing and handling bullying cases. In accordance with the opinions of research respondents, if AI successfully detects verbal bullying, further actions should be taken as follows.
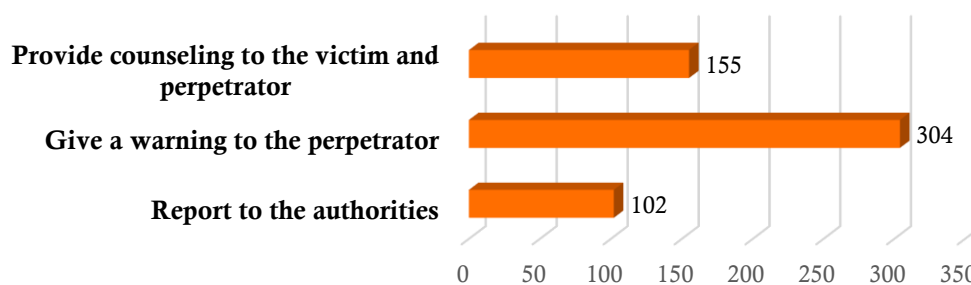
Figure 9. Follow-up for Bullying Cases

Based on the responses of research respondents, if AI technology successfully detects verbal bullying, 305 respondents stated to give a warning to the perpetrator, followed by providing counseling to victims and perpetrators by 155 respondents. Meanwhile, 102 respondents chose to report to the authorities in handling bullying cases.

Based on data from the Indonesian Child Protection Commission (KPAI), violence against children in early 2024 had reached 141 cases, with 35 percent of them occurring in school environments or educational units (Putra, 2024). In addition, 46

cases of children ending their lives, of which 48 percent occurred in educational units or victims were still wearing school clothes. Verbal bullying often goes undetected because it leaves no physical evidence and is often considered a normal social interaction (Ningrum, 2018). This has a serious psychological impact on victims, especially during the self-identity development phase. In response to the increasing cases of bullying, research shows that AI technology can be used to detect language patterns that contain elements of verbal violence, intimidation, or bullying through automated conversation analysis (Djamzuri & Mulyana, 2023).

Research findings support the importance of using AI technology in detecting verbal bullying for early prevention (Rovida & Sasmini, 2024). Based on respondents' responses, 305 respondents stated that if AI successfully detects verbal bullying, the most preferred action is to give a warning to the perpetrator, followed by providing counseling to the victim and perpetrator by 155 respondents. Meanwhile, 102 respondents chose to report the case to the authorities. This data indicates a desire to not only detect but also handle bullying cases with measures that support the rehabilitation of victims and perpetrators. Compared to the fact that bullying often goes undetected, the results of this study emphasize the potential of AI technology as a tool that not only helps identify cases of bullying, but also supports more effective prevention and treatment measures.

Conclusion

Based on the results and discussion, the development of AI technology to detect verbal bullying in school and campus environments can be implemented by ensuring that AI is able to understand language, including slang, sarcasm, and different social contexts, as well as distinguish normal conversation from bullying behavior. Performing voice and emotion recognition will also allow AI to monitor and identify bullying in real-time, while maintaining privacy. In addition, human supervision is still needed to verify AI detection results, such as collaboration with experts, such as psychologists, authorities, and educators. It is hoped that an anonymous reporting system can be added so that people feel safe reporting bullying cases without worrying about their privacy. Thus, AI will potentially be an effective tool in supporting efforts to create school and campus environments that are safe from verbal bullying. The development of AI technology to detect verbal bullying in school and campus environments can be implemented with clear and structured steps. One recommendation is a phased implementation that starts with limited testing on classroom conversations or in small groups before full-scale deployment. This aims to test the effectiveness of the AI system in detecting verbal bullying and to ensure that the system functions properly without raising technical or ethical issues. Also, to support this, training for teachers, psychologists, and related parties is also needed so that they can understand and utilize this technology properly. With this development, AI will not only become a detection tool, but also help create a safer school and campus environment.

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