

Exploring the Potential of ChatGPT in Developing a Virtual Assistant for Prevention and Support in Cases of School Bullying

Rodolfo Mendoza-Pinto

Universidad Nacional de San Agustín de Arequipa,
Av. Independencia s/n, Arequipa, Perú
rmendozapin@unsa.edu.pe

Abstract

Bullying is a global problem that negatively affects students, their families, and communities. This study addresses the creation and evaluation of an artificial intelligence (AI)-based chatbot to provide emotional support to student victims of bullying, using a combination of exploratory and descriptive approaches. A chatbot was developed on the Telegram messaging platform, integrating the ChatGPT API to improve response generation. A topic- and equity-sensitive design was implemented, and conversation logging and harassment detection functionality was enabled. The research focused on the technical functionality of the chatbot and its ability to provide emotional support and guidance. The chatbot proved to be capable of providing basic emotional support and guidance to users. The integration of ChatGPT enriched the consistency and contextualization of responses. Intuitive interaction was achieved through Telegram, providing relevant and contextually appropriate responses. Although this research focused on the technical functionality of the chatbot, its implementation in students and data analysis of user interactions represent important future steps. The chatbot has the potential to empower victims of bullying and improve school safety. In addition, this research contributes to the creation of a new tool for collecting and analyzing data on bullying, improving early detection and prevention.

Keywords: Bullying, Emotional support, Technology in education, Artificial Intelligence, ChatGPT.

1 Introduction

Bullying is presented as a serious and widespread problem globally, exerting a negative impact on students and generating detrimental consequences for their well-being and academic progress [1]. The academic literature has coincided in providing consistent definitions of this phenomenon.

Various authors have addressed bullying, describing it as a repeated and deliberate pattern of verbal, psychological or physical aggression directed at a peer, without provocation or possibility of defense [2]. This definition is complemented by additional contributions [3], which highlight various manifestations of violence, including physical, verbal forms and social exclusion. On the other hand, some researchers [4] underline the even greater threat that bullying poses to the development of young people, even putting their lives at risk. It is important to note that the scope of bullying is social in nature, affecting not only students, but also teachers, parents and educational institutions [5].

According to data provided by [6], globally, 32% of students have experienced bullying. Although physical bullying predominates in most regions, psychological bullying is prevalent in Europe and North America. In addition, cyberbullying affects up to 10% of children. Alarming, 36% have been involved in physical fights and 32.4% have been physically assaulted. In the Peruvian context, the Specialized System for Reporting Cases of School Violence (SISEVE) has documented 68,854 incidents nationwide until October 2023, and the secondary level is responsible for 56% of these cases [7]. This problem requires effective solutions, given the lack of accessibility to counseling and guidance for affected students.

Although there are reporting platforms such as SISEVE or the Municipal Ombudsman's Office for Children and Adolescents (DEMUNA), their complexity and lack of confidentiality discourage their use [8]. In addition, the workload of teachers and the lack of training in dealing with bullying limit the identification and attention of cases [9].

This situation places victims in a cycle of silence and suffering, as fear of reprisals and stigmatization prevent them from reporting, perpetuating the bullying and affecting mental health [10].

In response to this scenario, there is a pressing need for effective solutions. Technology, especially artificial intelligence chatbots, presents itself as a promising alternative to provide guidance and support to student victims of bullying. This research aims to explore the feasibility of this tool in the search for relief from this persistent problem. Telegram, a messaging and social networking platform, is notable for its emphasis on user privacy and security [11]. In addition to basic messaging functions, Telegram allows the creation of chat groups, broadcast channels, and bots, expanding its usefulness and versatility.

Artificial Intelligence (AI) empowers machines to execute tasks that previously required human intervention [12]. This field encompasses skills such as natural language processing, machine learning, and decision making. Artificial Intelligence (AI)-based chatbots are systems capable of collecting responses to user queries through natural language processing, natural language understanding and response generation, and machine learning. [13] highlights that these conversational AI bots can interact textually or verbally with users, generating the feeling of a genuine conversation.

ChatGPT is an artificial intelligence conversational interface that employs natural language processing to hold realistic conversations, challenging incorrect assumptions and rejecting inappropriate requests [14]. This system is continuously refined through reinforcement techniques, natural language processing, and machine learning, with the goal of achieving a more complete interaction with users [15]. In addition, the system's ability to generate coherent text in response to questions posed by the user even allows it to simulate conversations on a wide range of topics [16].

1.1 Background

In a local study, the creation of a conversational robotic agent using Google's Dialogflow and a physical robotic agent connected by Bluetooth was proposed to foster entrepreneurship in university students [17]. Successful results indicated that the conversational robotic agent enabled students to explore fields of entrepreneurial interest and receive useful responses from the chatbot and the robotic agent.

On the other hand, the application of an artificial intelligence-based chatbot for requirements and incident management in an insurance company was investigated [18]. Notable benefits included the automation of response times, improving the efficiency and quality of service in a clear way, thus contributing to an effective solution. In a different study, a chatbot was implemented in an Academic Research course at a private university in Lima [19]. The automation of tasks, the speed of responses, and its positive contribution in time management and in the development of the course were outstanding aspects.

At the Complutense University of Madrid, a bullying counseling chatbot was created [20]. The chat prototype, called OttoBot, was evaluated in the training of psychologists in bullying therapies, demonstrating its usefulness. In Italy, a formative evaluation of an online life skills coaching intervention was conducted [21]. Students who participated in sessions with the chatbot found the intervention beneficial, user-friendly, and innovative. In Germany, chatbots were introduced to support self-learning for higher education students, presenting encouraging results in improving the availability of digital tutoring [22]. In the United Kingdom, child perceptions regarding the potential support of a chatbot in online threat situations were explored [23], identifying expected tasks for the chatbot in such contexts. In the United States, an artificial intelligence-based system was developed to combat cyberbullying [24], managing to identify and stop harassing messages with high accuracy. In Malaysia, the adoption of chatbots in higher education institutions was investigated [25], concluding that the perception of trust and other factors influence the effectiveness of the adoption of these systems.

The present research addresses a problem of great social and educational significance: bullying, the prevalence of which makes it a major challenge [26]. The combination of Telegram chatbot together with Chat GPT emerges as a technological solution of great promise [13]. The constantly evolving natural language processing technology provides a solid foundation for addressing bullying, distinguished by its focus on innovative technologies such as Telegram, recognized for its accessibility, and the GPT model, capable of providing more humane and consistent responses [27].

A relevant point to highlight, is that these artificial intelligence (AI)-driven chatbots are scalable, dynamic and context-sensitive, allowing them to track different channels and languages [28]. In this sense, they differ from their predecessors in their ability to learn from usage patterns and user interactions, making them adaptive tools that improve over time. As AI technology advances, especially in the field of natural language understanding (NLU), the interest and application of these chatbots have expanded in various areas, both academic and industrial [22].

Consequently, AI-powered chatbots represent promising tools with the potential to enrich human interaction and provide support in various domains. Their ability to carry on conversations in a natural and seemingly human-like

manner makes them valuable resources in areas such as customer service, education, and personal assistance. From the perspective of artificial intelligence and natural language processing, the incorporation of the GPT model into a chatbot is a significant advance [29]. This research could fill a knowledge gap, as few studies have explored the use of chatbots to mitigate bullying in high school students.

The research proposal has the potential to contribute to the creation of a new tool for the collection and analysis of data related to bullying. The chatbot could provide a more dynamic and accessible intervention, improving early detection and prevention [15]. In addition, it would empower victims and enable early interventions, ultimately improving school safety [28]. Also, this study could influence how variables associated with bullying are addressed and analyzed, contributing to a more effective and technologically advanced approach [30].

Recent advances in AI-based chatbots for addressing educational and psychosocial issues have demonstrated great potential, although through diverse approaches. For instance, Chen et al. [31] highlight the effectiveness of hybrid models (XLNet + Bi-LSTM) in detecting cyberbullying with 98% accuracy, outperforming traditional models such as BERT. However, these applications have focused primarily on text analysis, in contrast to our chatbot, which incorporates proactive emotional support. Similarly, Kang et al. [32] evaluated chatbot use among 215 elementary school students, finding that 67% perceived them as useful for violence prevention (mean score: 3.43/5). Nonetheless, they also emphasized the need for more intuitive designs tailored to children—an insight that informed the design of our user interface through the use of Telegram.

1.2 Objectives

The general objective of this research is to develop a chatbot using the Telegram platform and the GPT Chat model as a platform for complaints and emotional assistance for student victims of bullying.

In line with this general objective, the following specific objectives are raised:

- Design the chatbot architecture on the Telegram platform, integrating the GPT Chat model for the generation of contextualized responses.
- Develop the chatbot using Google Apps Script, implementing the necessary interactions to provide emotional support to student victims of bullying.
- Implement the functionality of logging and storing conversations in a Google Sheets sheet.
- Verify the functionality of the chatbot in a controlled environment that simulates real situations.

2 Methods

In order to comprehensively address the objective of this research, a combined research approach was implemented that incorporated both exploratory and descriptive elements. This multidisciplinary approach allowed for a deeper and more holistic understanding of the phenomenon studied.

The methodology adopted encompassed several crucial phases for the development of the study. First, the conception and design of a chatbot tool specifically created for the purpose of the research was carried out. This crucial component involved not only the technical structuring of the chatbot, but also careful consideration of its usefulness and feasibility in the context of bullying prevention and support.

To contextualize and theoretically ground the research, an exhaustive review of the scientific and technical literature was carried out. This literature review focused on two key aspects: the phenomenon of bullying and the applications of artificial intelligence in the educational and mental health domains. The literature review was not limited to simple information gathering; rather, it was oriented towards identifying trends, challenges, and previous approaches in bullying prevention and support. Also, current developments in the field of chatbots and artificial intelligence were explored, with the aim of placing the research in the most up-to-date and relevant context.

2.1 Chatbot Design and Architecture

The design of the chatbot architecture for providing emotional support to students who are victims of bullying is based on a scalable and secure structure that integrates multiple layers and components, each performing specific roles to ensure optimal system functionality. The architecture leverages the Telegram platform as the user interface, Google Apps Script as the application logic engine, the ChatGPT API for natural language processing, and Google Sheets for data storage. Figure 1 illustrates this multilayered architecture and the interaction between its components.

The user interface layer is represented by the Telegram client, which acts as the primary point of contact between users and the chatbot. Telegram is chosen for its widespread adoption and robust API, facilitating smooth and accessible interaction for end users. Users interact with the chatbot via messages in Telegram, managed by the Telegram Bot API. This API enables the chatbot to receive and send messages, manage commands, and handle user sessions.

The application layer, developed in Google Apps Script, is the core of the system's logic. This layer handles business logic, interactions with external APIs, and conversation flow management. Google Apps Script, a JavaScript-based development platform, allows seamless integration with other Google services. The application layer processes user inputs, coordinates calls to external APIs, and ensures responses are contextually relevant and empathetic. The scripts are designed to be efficient and scalable, enabling the handling of multiple interactions simultaneously without performance degradation.

The natural language processing (NLP) layer is powered by the OpenAI ChatGPT API. This layer is essential for understanding and generating natural and contextually appropriate responses to user inputs. The ChatGPT API allows the chatbot to comprehend the context and intent behind messages, providing responses that are both relevant and empathetic. Integration with ChatGPT ensures that the chatbot can handle a variety of situations and questions, offering effective emotional support to users.

The data storage layer utilizes Google Sheets to log and store all conversations. This approach allows for structured and accessible data storage, facilitating both monitoring and analysis of user interactions. Google Sheets is chosen for its flexibility and ease of integration with Google Apps Script. Stored data includes conversation logs and relevant metadata, enabling subsequent analysis to detect bullying patterns and evaluate the chatbot's effectiveness.

The security layer incorporates authentication, encryption, and privacy controls to protect user information. Authentication ensures that only authorized users can access the chatbot, while encryption protects data in transit and at rest. Privacy controls are implemented to handle user data in accordance with data protection regulations, preserving the confidentiality and privacy of interactions.

The monitoring and logging layer is critical for ensuring system reliability and performance. A performance monitor continuously evaluates the operational efficiency of the chatbot, identifying potential bottlenecks and areas for improvement. Error logging captures and stores any issues that arise during interactions, allowing for rapid and efficient debugging. This proactive approach to monitoring and logging ensures that the chatbot can maintain a high level of service and respond quickly to any technical issues.

Finally, the business logic layer includes specific algorithms for bullying detection, emotional support logic, and conversation flow management. Bullying detection algorithms analyze user inputs for signs of bullying, triggering appropriate responses and recording incidents for review. The emotional support logic guides the chatbot to offer empathetic and supportive responses, tailored to the individual needs of users. Conversation flow management ensures that interactions are coherent and progress logically, enhancing the user experience.

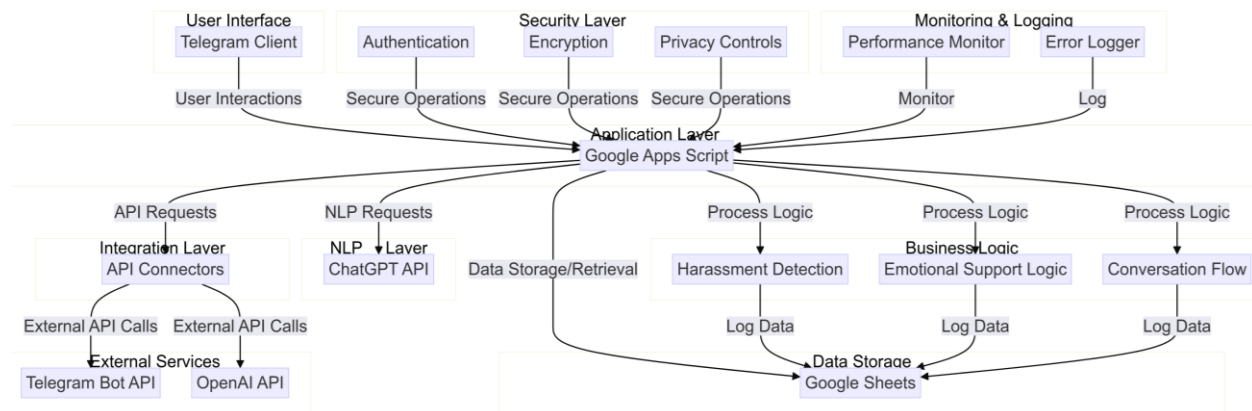


Figure 1: Design of the conversational architecture of the Chatbot

2.2 Ethical and Privacy Considerations in the Development of the Chatbot System

The development of artificial intelligence systems aimed at addressing sensitive issues such as school bullying requires an approach that balances technological innovation with strict ethical and privacy principles. In this study, a data

protection framework was implemented that integrates local legislation, international standards, and recent findings in human-computer interaction, ensuring a safe environment for underage users.

The system design incorporated protective measures aligned with current Peruvian legislation. Law No. 27337 [33] on the Protection and Well-being of Children and Adolescents supported the implementation of anonymous reporting mechanisms using unique codes not linked to user identity, in compliance with Articles 19 and 28 on protection against abuse and the right to a safe educational environment. Additionally, Law No. 29733 [34] on the Protection of Personal Data guided the establishment of strict protocols, which include: (1) informed consent adapted to minors, (2) a data minimization principle through the exclusive storage of anonymized text, and (3) AES-256 encryption for all stored records and communications.

From an ethical standpoint, the system was designed based on key insights from recent research. The findings of Keijsers et al. [35] on abusive interactions with chatbots led to the adoption of a deliberately non-anthropomorphic design, avoiding human-like names or avatars that might encourage inappropriate behavior. Similarly, following the privacy guidelines for minors proposed by Piccolo et al. [23], features such as automated deletion of conversations after 30 days and systematic obfuscation of personal data in stored logs were incorporated.

Controlled environment testing demonstrated the technical feasibility of the proposed approach. The system successfully managed sensitive interactions while maintaining the established privacy standards, with no data breaches reported during the evaluation period. Nevertheless, as highlighted by Rogovets et al. [36], it is essential to recognize that tools of this nature must be integrated within a broader psychoeducational support ecosystem, as their role is complementary and not a substitute for specialized human intervention.

2.3 Chatbot development

The development of the chatbot aimed at providing emotional support to students experiencing bullying was conducted following a systematic approach aligned with specific research objectives. This process encompassed several crucial stages, from initial setup to the implementation of advanced functionalities. To enable interaction, a bot was configured on Telegram using the platform's official API. A unique access token was obtained, enabling the bot to receive and send messages via the Telegram API, thereby establishing the primary communication channel between users and the system.

The core development of the chatbot was carried out using Google Apps Script, a cloud-based development platform that facilitates the creation of scripts seamlessly integrated with Google services. This technological choice streamlined the implementation of necessary logic to process messages received through the Telegram API and generate appropriate responses.

A pivotal component of the development was the integration of OpenAI's ChatGPT model. To achieve this, a communication layer between Google Apps Script and the ChatGPT API was implemented. This integration leveraged the model's advanced natural language processing capabilities to generate contextualized and empathetic responses. The integration process involved configuring authentication with the OpenAI API, implementing functions to send requests to the ChatGPT API, and processing and formatting received responses for use within the chatbot context.

The chatbot interaction flow, as illustrated in Figure 2, was designed to be intuitive and efficient. It begins with message reception, where the chatbot captures user messages via Telegram. Initial processing in Google Apps Script applies logic to determine user context and intent. Based on this analysis, a request is sent to the ChatGPT API to generate a relevant and empathetic response. Finally, generated responses are sent back via Telegram to the original user, completing the interaction cycle.

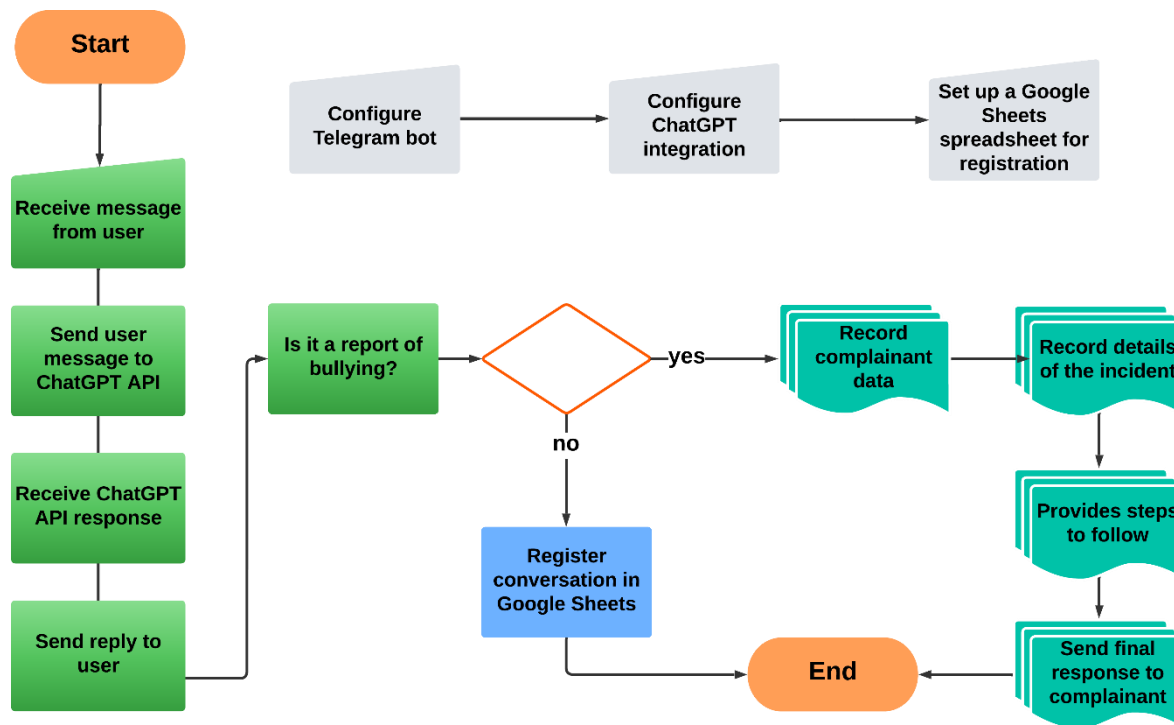


Figure 2: Chatbot flowchart

Aligned with research objectives, several key functionalities were implemented. A logging system was developed to store all conversations in a Google Sheets spreadsheet, enabling detailed tracking of interactions and facilitating post-analysis. Additionally, keyword detection logic was implemented to identify patterns associated with bullying situations, enabling the chatbot to recognize potential bullying cases and respond appropriately. For each reported case, the chatbot generates a unique incident code, facilitating individual case tracking and providing users with a reference for future inquiries. Predefined responses were also programmed, and the ChatGPT model was trained to offer practical recommendations and emotional support tailored to different bullying scenarios.

To enhance the quality and relevance of generated responses, an optimization process for the ChatGPT model was conducted. This involved training with specific datasets containing detailed examples of chat interactions related to bullying situations. Fine-tuning of model parameters, such as temperature and maximum token length, was performed to optimize response generation. Additionally, a periodic review system of generated responses was implemented to identify areas for improvement and make necessary adjustments.

Given the sensitive nature of interactions, security and privacy measures were implemented. All conversations and stored data were encrypted to protect user information. A system was developed to anonymize personal information in conversation records, and clear policies on data retention and deletion were established.

The development process concluded with a comprehensive phase of testing and validation. Unit tests were conducted for each individual chatbot component to ensure proper functionality, followed by integration tests to verify adequate interaction among all system components. Various bullying scenarios were simulated, and the results of these tests are shown in Figure 3, which provides visual evidence of the chatbot's functionality under diverse conditions. Furthermore, experts in educational psychology and bullying prevention were engaged to assess the quality and appropriateness of the chatbot's responses.

This methodical and thorough development process resulted in a chatbot capable of providing emotional support and guidance to students affected by bullying, aligning effectively with the research's established objectives. The developed system not only offers an intuitive and accessible interface via Telegram but also incorporates advanced natural language processing capabilities through ChatGPT integration, enabling a more natural and empathetic interaction with users. The combination of these technical features with specific functionalities implemented to address bullying makes this chatbot a promising tool in combating bullying in educational settings.



Figure 3: Screenshots of the test phase

3 Results

The chatbot was tested in a controlled environment to evaluate its ability to provide emotional support to students who are victims of bullying and to adequately handle incident reports. The following interaction illustrates a representative case in which a student interacts with the chatbot to report a bullying incident and seek guidance on how to handle similar situations in the future.

Upon initiating the interaction with the command "/start", the chatbot introduces itself in a friendly manner and offers immediate assistance, demonstrating an intuitive and accessible user interface. The student expresses the intention to report a bullying incident. The chatbot responds empathetically and requests specific details, including the student's name, grade, section, and a description of the incident. This structured prompt facilitates the collection of essential data for the formal registration of the case.

In this scenario, the student reports that a classmate takes their belongings and physically assaults them when attempting to retrieve them. The chatbot responds with empathy, thanks the student for the information provided, and registers the incident by generating a unique identification code ("DENUNCIA_A00001"). This function ensures that reported cases can be properly tracked and managed.

Beyond case registration, the chatbot encourages the student to seek help from trusted adults, such as teachers, counselors, or family members. It provides emotional reassurance and practical strategies to manage similar incidents in the future, including staying calm, setting boundaries, documenting events, and fostering peer support. These actions are intended to promote empowerment, safety, and resilience.

The interaction concludes with the chatbot reaffirming its availability and encouraging the student to return for future assistance. This closing reinforces the system's commitment to accessibility and continuous emotional support.

The analysis of this case reveals several strengths of the chatbot:

- **Empathy and Emotional Support:** The chatbot consistently offers empathetic and supportive responses, essential for students experiencing distress.
- **Structured Information Collection:** Requests for detailed input ensure accurate and complete case documentation.
- **Generation of Report Codes:** Automatically issuing a unique code for each case supports efficient case tracking and data management.
- **Guidance and Coping Strategies:** The inclusion of practical advice enhances the chatbot's role as both a support and prevention tool.
- **Availability and Accessibility:** The chatbot's readiness and simplicity of use foster trust and repeat engagement.

In addition to the individual interaction described above, a broader performance evaluation was conducted using six predefined test scenarios representing varied types of bullying and user behaviors. This assessment aimed to measure the system's effectiveness across multiple performance dimensions. The results are summarized in Table 1.

Table 1: Summary of Chatbot Performance in Simulated Bullying Scenarios

Category	Metric	Result
Functionality	Successful handling of cases	6 out of 6 scenarios completed successfully (100%)
Accuracy	Harassment detection rate	90% of relevant terms correctly identified
Efficiency	Average response time	Between 2 and 5 seconds
Empathy and Coherence	Contextual and emotionally appropriate responses	85% of responses rated as empathetic
Case Registration	Incidents logged with unique code	100% of cases assigned a tracking code

Figure 4 presents a multivariable performance evaluation of the AI-based conversational system across seven critical dimensions: harassment detection accuracy, response consistency, interaction intuitiveness, response speed, data logging and storage, context adaptability, and AI model efficiency.

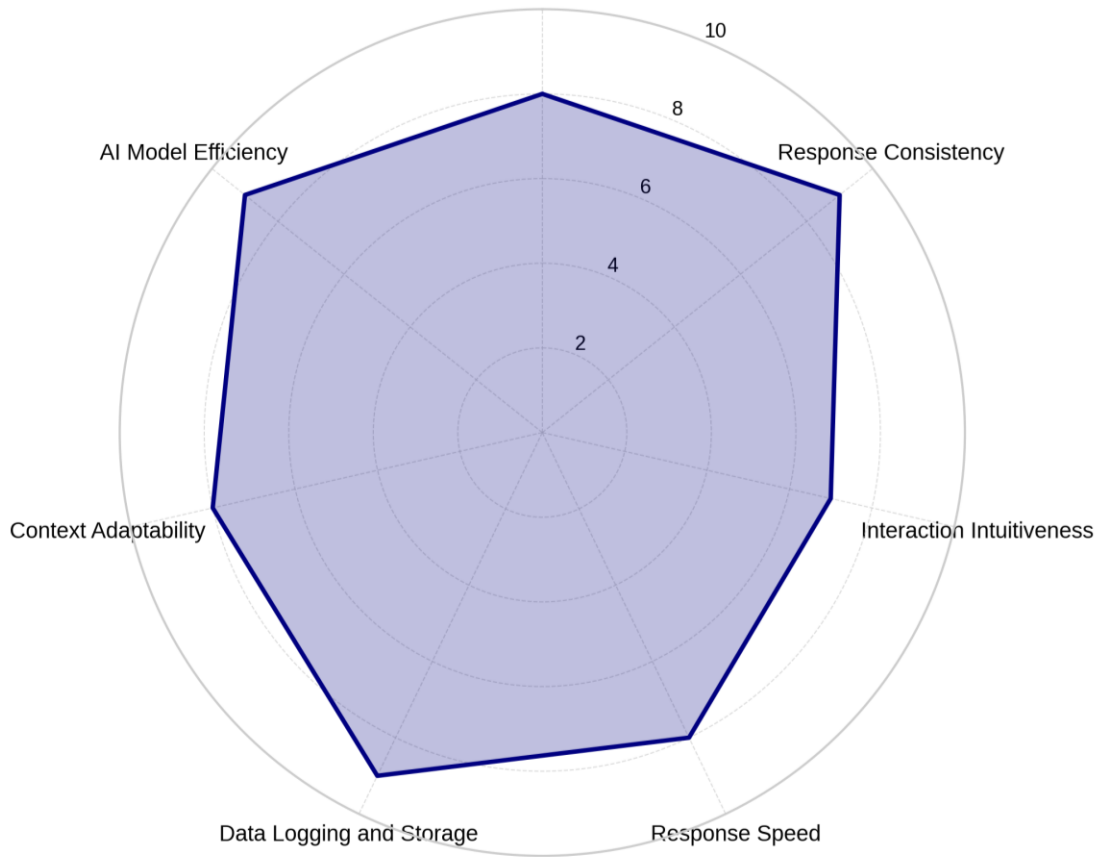


Figure 4: Performance Evaluation of AI Interaction System

The results highlight exceptional performance in three areas. First, the chatbot achieved high consistency in generating semantically coherent and emotionally appropriate responses across varied user inputs, an essential feature for deployment in educational and psychosocial settings. Second, the model demonstrated strong computational efficiency, indicating that it can process complex interactions without compromising performance. Third, it achieved high accuracy in detecting inappropriate or hostile content, reinforcing its potential for use in digital environments requiring content moderation and student protection.

Nevertheless, intermediate scores were observed in three categories. Interaction intuitiveness—the system’s ability to simulate natural conversation—received a moderate score, which could affect usability among young or non-technical users. Response speed, while within acceptable limits, showed variability depending on message complexity, suggesting a need for further optimization in real-time applications. Context adaptability, or the system’s ability to adjust its behavior to evolving or diverse scenarios, also showed room for improvement and may benefit from enhanced learning algorithms or dynamic response frameworks.

4 Discussion

The results obtained in this study demonstrate the potential of artificial intelligence-based chatbots to provide emotional support and guidance to students experiencing school bullying. The effectiveness of the developed chatbot in delivering support and guidance aligns with previous research in similar areas, such as studies by Gabrielli et al. [21]

and Neumann et al. [22], which highlight how AI-based chatbots have shown their capability to enhance user interaction and provide assistance in various domains.

The integration of the ChatGPT model into the chatbot has proven to be a valuable advancement in generating more coherent and contextually relevant responses. These findings are consistent with Lund et al.'s research [13], emphasizing how natural language processing technology enhances human-chatbot interaction. Furthermore, this improved responsiveness can translate into a more satisfactory user experience, which is crucial in emotional and sensitive contexts addressed in this study.

The intuitive interaction achieved on the Telegram messaging platform is a critical aspect for the chatbot's success. This is aligned with findings from Çakmak et al. [11], suggesting that platforms like Telegram can be particularly effective in communicating with young users due to their familiarity with instant messaging technology.

However, it is important to acknowledge the limitations of this study. As noted by Tlili et al. [14], the use of AI in education raises ethical and privacy challenges that need to be addressed. In this regard, our approach to data anonymization and clear retention policies aligns with best practices in the field. Additionally, as cautioned by Salvagno et al. [15], it is crucial to recognize that AI models like ChatGPT may generate inaccurate or biased information, underscoring the importance of human supervision and expert validation in the development and use of these systems.

The implementation of a unique code system for incident reporting, along with the ability to store and analyze conversations, offers significant opportunities for future research. As suggested by Curioso and Brunette [37], there is ample potential to develop and evaluate computer-assisted diagnostic algorithms in this field. These data could provide valuable insights into bullying patterns and the effectiveness of different intervention strategies.

It is important to note that while the developed chatbot shows promising results, it should not be considered a substitute for professional human intervention. Rather, as suggested by Piccolo et al. [23], it should be viewed as a complementary tool that can enhance accessibility and immediacy of support available to students.

The adoption of chatbots in educational settings, as explored in this study, aligns with trends observed by Gonçalves et al. [27] and Gkinko and Elbanna [28], who highlight the growing use of conversational AI in various sectors. However, as pointed out by Rahim et al. [25], the effective adoption of these technologies in educational institutions depends on several factors, including user trust perception.

From a technical perspective, the use of Google Apps Script and integration with Google services, as implemented in this study, offers advantages in terms of scalability and ease of implementation. However, as cautioned by Miralles [38], careful consideration of data protection aspects when using cloud services, especially when handling sensitive data of minors, is crucial.

Despite the promising results, this study presents certain technical and methodological limitations. The evaluation was conducted using simulated scenarios, which, while useful for controlled analysis, may not fully capture the complexity and emotional variability of real-life bullying cases. Additionally, the limited scope of test cases may affect the generalizability of the findings to broader educational contexts. From a technical perspective, the use of platforms such as Telegram and Google Apps Script, although practical and accessible, may pose scalability and data protection challenges, especially when dealing with minors' sensitive information. Future research should focus on deploying the chatbot in real educational environments to assess its effectiveness in real-time interactions. Longitudinal studies could provide insights into the long-term impact of chatbot interventions on student well-being and reporting behavior. Moreover, expanding the variety of simulated scenarios, integrating multilingual capabilities, and involving professionals in psychology and education in the design and validation process will be essential to enhance the chatbot's reliability, ethical integrity, and emotional appropriateness.

5 Conclusions

The present study has demonstrated the significant potential of integrating artificial intelligence technologies, specifically chatbots based on advanced natural language processing models like ChatGPT, in combating school bullying. Through the development and implementation of a chatbot on the Telegram platform, we have created a tool that provides immediate emotional support and guidance to students who may be experiencing bullying situations.

The main conclusions derived from this research are as follows:

- The study has shown the technical feasibility of developing a sophisticated chatbot using accessible tools such as Google Apps Script and the Telegram API, integrated with advanced AI technologies like ChatGPT. This

combination enables the creation of robust and scalable solutions to address complex social issues such as school bullying.

- Effectiveness in support provision: Results suggest that the chatbot is capable of providing contextually relevant and empathetic responses, offering a first level of emotional support and guidance to students. This could be particularly valuable in situations where immediate access to human counselors is not possible.
- Potential for data collection: The implementation of a conversation logging system and unique incident reporting codes offers a valuable mechanism for systematically collecting data on school bullying incidents. This could significantly contribute to understanding patterns and trends in bullying, informing more effective prevention and intervention strategies.
- Accessibility and familiarity: Using a widely-used messaging platform like Telegram enhances accessibility and reduces adoption barriers for students, potentially encouraging greater usage compared to more formal reporting tools.
- Ethical and privacy challenges: The study has highlighted the critical importance of carefully addressing ethical and privacy considerations in the development and deployment of AI technologies in educational and mental health contexts. Implementing robust security and privacy measures is essential to protect vulnerable users.
- Need for human oversight: Despite advancements in AI, the research underscores the ongoing importance of human supervision and validation, especially in sensitive contexts such as supporting victims of school bullying. The chatbot should be considered a supplementary tool, not a replacement for professional human intervention.
- Potential for future research: The developed system lays the groundwork for future research in areas such as the long-term effectiveness of AI-based interventions, integrating chatbots into broader school bullying prevention strategies, and developing more advanced algorithms for early detection of bullying situations.

This study represents a significant step towards the practical application of artificial intelligence in combating school bullying. While the results are promising, they also highlight the need for a cautious and ethical approach in implementing these technologies. The developed chatbot has the potential to be a valuable tool in the arsenal of strategies to combat bullying, offering immediate and accessible support to students while providing valuable data to inform educational policies and practices.

Looking ahead, it is essential to continue refining and evaluating these tools, ensuring they are effectively and ethically integrated into educational environments. Ongoing collaboration among educators, psychologists, technology experts, and policymakers will be crucial to maximizing the potential of these technological innovations in creating safer and more supportive school environments for all students.

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