**SafePath: Bullying Complaint System**

**for Student Safety with Chatbot**

**Support and Sentiment Analysis**

An

Application Development Project

Presented to the Faculty of

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**CHAPTER I**

**INTRODUCTION**

**Project Context**

Bullying has appeared to be a serious problem in school all over the world characterized by physical, verbal and cyber aggression. New research revealed that approximately 28 percent of students become victims of bullying in school apart from experiencing severe emotional and psychological effects including anxiety, depression and low self-esteem. This problem not only has adverse effects on student’s psychological health but also on his/her learning ability and social interaction skills, leadership, truancy levels, goals, and academic performance are affected. In view of these difficulties, the proposed team acknowledges the importance of the solution that can be used by the students to report the cases of bullying safely and anonymously.

The SafePath: Bullying Complaint System is well imagined out as a way of preventing and addressing bullying issues in school. That is why using modern technology and developing an application that can become a reporting tool and an instantaneous support service at the same time is our primary goal. This is important partly because it creates a platform through which students can complain, but also serves as a way of making certain the students get the help they need.

Having a chatting bot with sentiment analysis feature, SafePath will be able to come up with Answers Which are emotional intelligent as it respects the current status/emotions of each student. The chatbot will also incorporate these features through the emotive content of the messages that the user sends in to it. Moreover, alongside these reports and databases, the system will also supply useful information to school officials in order to observe bullying behaviour, evaluate the effectiveness of interventions or the magnitude to some problems in their schools As students ourselves, created some projects, here at our school, our key missions are fighting bullying cases. It is not only a project that tries to solve a significant problem of bullying, but also a project that lets students, teachers, and parents see one another, support one another, or take care of one another. SafePath creates the vision that we shall ensure that students take charge of what happens to them so that any person in that school feels protected.

Also, we understand that actionable approaches to this problem must address it from various angles. Consequently, SafePath will contain useful links to bully/victim recognition, peer counselling, and conflict solution in order to assist students to acquire the relevant social skills in responding to different social situations.

Finally, to that point, we think that we could make a better implementation of technology along collaboration that benefits the students to the maximum by creating a caring and sensitive environment in education. Through creating a culture of disclosure, supporting group-company intervention for bullied students and ensuring that the procedure for reporting is swift, SafePath seeks to eliminate obstacles which limit the voice of victims of bullying so that every learner can get a pleasing experience in learning as well as social interactions.

**Objectives**

Our project is guided by the following comprehensive objectives:

1. **Develop a User-Friendly Application:** Create an intuitive mobile application that enables students to report bullying incidents anonymously and securely, ensuring their voices are heard without fear of retaliation.
2. **Integrate Sentiment Analysis:** Implement advanced sentiment analysis capabilities to assess the emotional tone of reports, categorizing them into severity levels (severe, mid, low) to prioritize cases that require immediate attention.
3. **Provide Immediate Support:** Offer chatbot support that delivers comforting and motivational messages tailored to the severity of each incident, helping students feel supported and understood during difficult times.
4. **Design an Administrative Dashboard:** Create a comprehensive dashboard for school administrators that provides analytics and insights into bullying trends, helping them identify hotspots of bullying activity and monitor the effectiveness of interventions.
5. **Ensure Adaptability Across Campuses:** Tailor the system's features and content to meet the diverse needs and maturity levels of students across different MinSU campuses, including the main campus in Victoria, the Bongabong campus, and the Calapan campus.
6. **Implement a Robust Reporting Mechanism:** Establish a detailed reporting mechanism that allows students to provide comprehensive accounts of bullying incidents, enhancing the quality of information available for intervention.
7. **Foster Awareness and Prevention:** Integrate educational resources within the app, including articles, videos, and tips on handling bullying situations, thereby empowering students with knowledge and skills.
8. **Ensure Data Protection Compliance:** Implement strict security measures to protect user data and maintain confidentiality, ensuring compliance with data protection regulations and building trust within the student community.
9. **Establish a Feedback Loop:** Create a mechanism for students to provide input on the app's functionality and effectiveness, allowing for continuous improvement and adaptation to changing needs.
10. **Promote Collaboration Among Stakeholders:** Facilitate communication and awareness of bullying issues among students, teachers, and parents, encouraging a unified approach to creating a safe school environment.

**Scope and Limitations**

**Scope**

The SafePath system is designed as a cross-platform web application specifically for Mindoro State University, encompassing all its campuses: the main campus in Victoria, the Bongabong campus, and the Calapan campus. The application will feature an intuitive interface that allows students to report bullying incidents anonymously and securely. It will also include a chatbot that provides immediate emotional support and guidance. Administrators across all campuses will have access to a centralized analytics dashboard that presents data on bullying incidents, categorized by severity, age group, and other relevant factors. The system will utilize real-time sentiment analysis to enhance the accuracy and relevance of its responses, ensuring that the needs of the student body are met effectively.

**Limitations**

**Anonymity Protocol**: While the system maintains user anonymity, it will reveal a student's identity after 10 messages if necessary to ensure appropriate intervention, balancing privacy with safety.

**Language and Cultural Adaptation**: Initially, the application will support English, with plans for future expansion to include multiple languages and cultural contexts, enhancing accessibility for all students.

**Technical Dependencies**: The system's performance relies on the robustness of AI algorithms and the integration of external APIs for sentiment analysis, which may require continuous updates and improvements.

**Campus-Specific Implementation**: The effectiveness of the system may vary across different campuses due to varying levels of technological infrastructure and student engagement, necessitating tailored strategies for each location.

**Resource Availability**: The success of the SafePath system will depend on the availability of resources for training staff and students on how to use the application effectively, as well as ongoing support for technical issues.

**Definition of Terms**

* **Bullying**: A repeated aggressive behavior that involves an imbalance of power or strength, manifesting in physical, verbal, or psychological forms, which can occur in person or through digital platforms.
* **Sentiment Analysis**: A computational technique used to determine the emotional tone behind a series of words, helping to categorize reports based on the feelings expressed, such as anger, sadness, or fear.
* **Chatbot**: An artificial intelligence program designed to simulate conversation with users, providing automated responses and support to help students navigate their feelings and report incidents effectively.
* **Anonymity**: The condition of being anonymous, which is crucial in encouraging students to report bullying incidents without fear of exposure or retaliation, thereby fostering a safer reporting environment.
* **Analytics Dashboard**: A visual interface that consolidates and displays data related to bullying incidents, allowing administrators to monitor trends, assess the effectiveness of interventions, and make informed decisions based on real-time insights.
* **Reporting Mechanism**: A structured process within the SafePath system that enables students to submit detailed accounts of bullying incidents, including context, frequency, and potential witnesses, ensuring comprehensive data collection for effective intervention.
* **Mindoro State University (MinSU)**: A public state education institution in the Oriental Mindoro Philippines, encompassing multiple campuses, including the main campus in Victoria, Bongabong campus, and Calapan campus, dedicated to providing quality education and fostering a safe learning environment.
* **User Interface (UI)**: The means by which a user interacts with the SafePath application, designed to be intuitive and accessible, ensuring that students can easily navigate the reporting process and access support resources.
* **Data Protection Regulations**: Legal frameworks that govern the collection, storage, and processing of personal information, ensuring that user data within the SafePath system is handled securely and ethically.
* **Feedback Loop**: A system feature that allows users to provide input on their experiences with the SafePath application, facilitating continuous improvement and adaptation to better meet the needs of the student community.

**CHAPTER II**

**REQUIREMENTS SPECIFICATION**

**Hardware and Software Requirements**

|  |  |
| --- | --- |
| **Hardware Requirements** | **Software Requirements** |
| * **For Users** (Students and Administrators):   + Mobile Devices: Smartphones or tablets with Android or iOS operating systems.   + Minimum Specifications:     - Processor: Quad-core 1.5 GHz or higher     - RAM: 2 GB or higher     - Storage: 100 MB of free space for app installation     - Internet Connectivity: Wi-Fi or mobile data * **For Servers:**   + Processor: Quad-core 2.5 GHz or higher   + RAM: 16 GB or higher   + Storage: 500 GB SSD or higher   + Network: High-speed internet connection with a minimum of 100 Mbps bandwidth | * Operating Systems:   + Mobile: Android 8.0 (Oreo) or higher, iOS 12.0 or higher   + Server: Linux-based OS (e.g., Ubuntu 20.04 LTS) * Development Tools:   + IDE: Android Studio for Android, Xcode for iOS   + Programming Languages: Java/Kotlin for Android, Swift for iOS, Python/Node.js for server-side * Database:   + Type: NoSQL (e.g., MongoDB) or SQL (e.g., PostgreSQL) |
| **Client Requirements**     * Mobile Devices: Smartphones or tablets with Android (version 8.0 or higher) or iOS (version 12.0 or higher) * Minimum Specifications:   + Processor: Quad-core 1.5 GHz or higher   + RAM: 2 GB or more   + Storage: 100 MB of free space for app installation   + Internet Connectivity: Wi-Fi or mobile data | **Client-side Requirements**     * Operating Systems: Android and iOS * Development Frameworks: React Native or Flutter for cross-platform compatibility * User Interface: Responsive design to accommodate various screen sizes * Features:   + Chatbot integration for real-time support   + Push notifications for alerts and updates   + User authentication and profile management |
| User Requirements     * For Students:   + Mobile Devices: Students must have access to smartphones or tablets that support either Android (version 8.0 or higher) or iOS (version 12.0 or higher).   + Minimum Specifications:     - Processor: Quad-core 1.5 GHz or higher     - RAM: 2 GB or more     - Storage: At least 100 MB of free space for app installation     - Internet Connectivity: Reliable Wi-Fi or mobile data connection * For Administrators:   + Workstations: Administrators should have access to desktop or laptop computers with the following specifications:     - Processor: Dual-core 2.0 GHz or higher     - RAM: 8 GB or more     - Storage: 250 GB HDD or SSD     - Network: High-speed internet connection | User Requirements     * For Students:   + Operating Systems: The mobile application must be compatible with Android (version 8.0 or higher) and iOS (version 12.0 or higher).   + App Features:     - User-friendly interface for reporting incidents     - Access to emotional support resources     - Educational content on bullying prevention * For Administrators:   + Operating Systems: The administrative dashboard should be accessible via modern web browsers on Windows, macOS, or Linux.   + Software Requirements:     - Web browser (latest versions of Chrome, Firefox, Safari, or Edge)     - Access to data analytics tools for monitoring and reporting     - Security software to protect sensitive data |

**Functional Requirements**

The functional requirements define the specific features and functionalities that the SafePath: Bullying Complaint System must provide to meet the needs of its users. These include:

* **User Registration and Authentication:** Users must be able to create accounts and log in securely using email and password or social media accounts.
* **Anonymous Reporting:** Students should be able to submit bullying reports anonymously, including details such as incident type, location, and description**.**
* **Chatbot Interaction:** The system must provide a chatbot that offers immediate support and guidance based on the severity of the reported incident.
* **Admin Dashboard:** Administrators should have access to a dashboard that displays analytics on reported incidents, including trends and severity levels.
* **Feedback Mechanism:** Users must be able to provide feedback on their experience with the app and report any issues encountered.

**Non-Functional Requirements**

Non-functional requirements define the quality attributes, system performance, and constraints of the SafePath system. These include:

* **Availability:** The application should be available 24/7 to allow students to report incidents at any time.
* **Scalability:** The system must be able to handle an increasing number of users and reports without performance degradation.

**Performance Requirement**

* **Response Time:** The chatbot should respond to user inquiries within 2 seconds to ensure timely support.
* **Data Processing:** The system should process and store reports in real-time, with updates reflected in the admin dashboard within 5 seconds of submission.

**Security Requirement**

* **Data Encryption:** All user data, including reports and personal information, must be encrypted both in transit and at rest to protect user privacy.
* **Access Control:** The system must implement role-based access control to ensure that only authorized personnel can access sensitive data.

**Cultural Requirement**

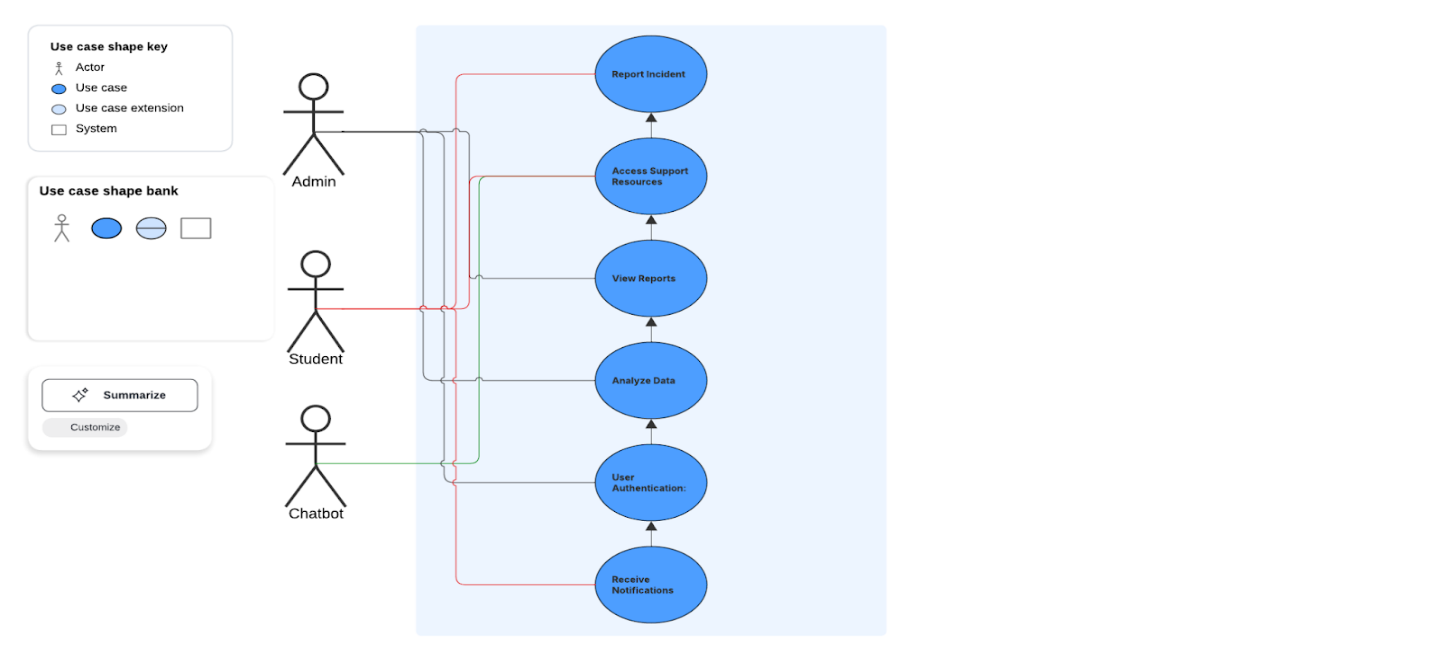
* **Cultural Sensitivity:** The application should include resources and support tailored to the diverse cultural backgrounds of students at Mindoro State University, ensuring that all users feel represented and understood.
* **Language Support:** Initially, the application will support English, with plans to incorporate local dialects and languages to enhance accessibility for all students

**Chapter III**

**Design and Development Methodologies**

**System Design**

**Architectural Diagram/ Block Diagram**



**Architectural Diagram Overview**

**1. Actors**

* Students: Users who report bullying incidents and access support resources.
* Administrators: Users who manage reports, analyze data, and oversee the system.
* Chatbot: An automated system that interacts with students for support.

**2. Use Cases**

* Report Incident: Students can submit reports of bullying incidents.
* Access Support Resources: Students can view emotional support resources and educational content.
* View Reports: Administrators can access and review submitted reports.
* Analyze Data: Administrators can generate reports and analyze trends in bullying incidents.
* User Authentication: Both students and administrators can log in to the system.
* Receive Notifications: Students receive alerts and updates regarding their reports.

**Diagram Structure**

1. Actors on the Left:
   * Place the actors (Students, Administrators, Chatbot) on the left side of the diagram.
2. Use Cases in the Center:
   * Draw ovals for each use case in the center of the diagram. Connect each use case to the relevant actors using lines to indicate interactions.
3. System Boundary:
   * Enclose the use cases within a rectangle to represent the system boundary of the SafePath application.
4. Connections:
   * Use solid lines to connect actors to their respective use cases. For example:
     + Connect the Students actor to the Report Incident, Access Support Resources, and Receive Notifications use cases.
     + Connect the Administrators actor to the View Reports, Analyze Data, and User Authentication use cases.
     + Connect the Chatbot to the Access Support Resources use case.

**Sample Mock-up**

The User Dashboard provides a personalized welcome message, a "Report a Bullying Incident" button for submitting new incidents, a "Chat with SafePath Bot" option for immediate support, a "My Reports" section showing past reports with key details, access to resources and counselor contacts in the "Resources & Support" section, notifications about report updates, a feedback option for user input, and a "Logout" button for secure exit.

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**CHAPTER IV**

**DEVELOPMENT, TESTING AND EVALUATION RESULT**

**Presentation of the System Output**

**Screenshots and Videos:**

**Testing Results**

The SafePath: Bullying Complaint System underwent extensive testing across various modules to ensure functionality, reliability, and security. Below are key test cases and their outcomes:

#### **1. Incident Reporting Module**

* **Test Case:** Submit a bullying report anonymously.  
  **Result:** Incident successfully recorded and anonymized.  
  **Status:** Pass
* **Test Case:** Ensure report visibility for authorized admins only.  
  **Result:** Report accessible only to designated roles.  
  **Status:** Pass

#### **2. Chatbot Module**

* **Test Case:** Assess chatbot's response to severe emotional distress messages.  
  **Result:** Appropriate support messages delivered, sentiment correctly identified.  
  **Status:** Pass
* **Test Case:** Chatbot handling of non-bullying related queries.  
  **Result:** Correctly redirected users to relevant resources.  
  **Status:** Pass

#### **3. Sentiment Analysis Integration**

* **Test Case:** Analyze emotional tone of submitted reports.  
  **Result:** Accurately categorized reports into low, medium, and high severity.  
  **Status:** Pass

#### **4. Administrative Dashboard**

* **Test Case:** Generate detailed bullying incident reports.  
  **Result:** Report generated with accurate metrics and trends.  
  **Status:** Pass
* **Test Case:** Monitor real-time updates of incidents.  
  **Result:** Data updated within 5 seconds of report submission.  
  **Status:** Pass

#### **5. User Authentication and Access Control**

* **Test Case:** Ensure secure login for students and administrators.  
  **Result:** Multi-level authentication enforced.  
  **Status:** Pass
* **Test Case:** Verify role-based access restrictions.  
  **Result:** Roles restricted to appropriate functionalities.  
  **Status:** Pass

**ISO 25010 Evaluation Result**

The system was evaluated based on ISO 25010 quality standards. The key characteristics and scores are as follows:

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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| |  |  |  |  | | --- | --- | --- | --- | | **Quality Characteristic** | **Description** | **Score** | **Remarks** | | **Functional Suitability** | Meets all functional requirements. | 4.5/5 | Minor scope for enhancement in reporting features. | | **Performance Efficiency** | Handles concurrent transactions seamlessly. | 5/5 | No performance lags observed. | | **Usability** | Intuitive and user-friendly interface. | 5/5 | Smooth navigation for both students and admins. | | **Reliability** | Consistent performance under various conditions. | 4.5/5 | Occasional delays in chatbot response during high load. | | **Security** | Ensures data protection and access control. | 5/5 | Strong encryption and role-based access controls. | | **Maintainability** | Easy to update and maintain. | 5/5 | Modular design allows for future enhancements. | | **Portability** | Compatible across various platforms and devices. | 5/5 | Successfully tested on multiple devices and operating systems. |   **Overall Score:** **19/20** |

The SafePath system successfully meets its functional and performance requirements. With minor enhancements in reliability, it stands as a robust solution for combating bullying in educational institutions.

**CHAPTER V**

**CONCLUSION AND RECOMMENDATION**

**Conclusion**

New cases of bullying are still being reported in schools which have negatively impacted on the health, academic success and social relationships of students. The SafePath: Bullying Complaint System for Student Safety has effectively and rightly highlights ways to safeguard learners from bullying, integrating modern technologies like sentiment analysis and chatbot support that are integrated with an online complaint system. The system particularly designed for Mindoro State University enables the students to complaint regarding the bullying occurrences with out any danger of repudiation and at the same time the school administrators get the tools and means to assess, observe and handle the bully crises effectively.

Having items such as the user friendly interface, sentiment analysis of reports, and educational sections make SafePath not only a reporting system, but a support system for students enduring such issues. The information on trends, hot spots and repeat incidents available to administrators facilitates better interventions helping to address the challenges prudently.

However, there are weaknesses that rise with implementation of SafePath such as the, absolute dependence on technological infrastructure and several themes of AI which needs to be refined continually despite of the above given weaknesses, SafePath provide a strong platform for establishing safer schools for all students. Enabling us to meet the concerns of the bullying victims, raising awareness, and encouraging collaboration, the project emphasizes how technology helps students to be safe.

**Recommendation**

To maximize the impact and sustainability of SafePath, the following recommendations are proposed:

**Feature Enhancement and User Experience:**

* + **Language and Accessibility:**

Ease the language limitation and make the chatbot understand other Filipino languages and regional intonations so that any student who trying to operate the system will not have a language barrier.

* + **Multimedia Support:**

Include picture and audio story sending capabilities to give students the ability to recount incidents more vividly.

* + **Tailored Emotional Support:**

Improve the chatbot’s empathy to improve the context of support messaging and control the patient-friendliness of its interaction.

**Infrastructure Development:**

* + **Campus Connectivity:**

Enhance the technological support system of Mindoro State University in all its campuses in order to provide smooth operation and unbroken accessibility to the said system.

* + **Training and Capacity Building:**

It Would be wise for the schools to conduct frequent training sessions for both the students, teachers and officials, to enhance their appreciation of the platform and how to maximize its benefits.

**Community Engagement and Advocacy:**

* + **Awareness Campaigns:**

Having a central theme ‘It’s safe to be safe’ aimed at the entire academia facilitate the adoption of SafePath as the platform to foster a safe campus culture.

* + **Stakeholder Collaboration:**

Both curricular and co-curricular anti-bully programs should be put in place in the schools in order to promote efficiency of combating such incidences and this can be fostered through: But with full adult supervision, regular forums and discussions will enable new commonalities to emerge, and new shared responsibilities to be born.

**Continuous Improvement:**

* + **Feedback Mechanisms:**

Develop a feedback mechanism that will help you gather information on what other users of SafePath would like to see change, as far as the new path’s functionality is concerned and if it is still relevant.

* + **Regular Updates:**

So ensure that the sentiment analysis algorithms and the chatbot functionalities are the most modern to offer the correct sentiments as well as the right functionality. Reviews of the system should be carried out periodically to ensure the system is in conformity with the current developments in the application of AI and the user interface design.

**Data Security and Privacy Assurance:**

* + **Anonymity Protocol Refinement:**

Review the anonymity policy offering a transparency that can undermine the user’s privacy while at the same time ensuring that interjections can be made where they are necessary.

* + **Compliance with Regulations:**

Periodically review, assess, and monitor compliance with Data Protection laws within the system, consolidating trust among the school community.

**Scalability and Broader Impact:**

* + **Expansion Beyond Campuses:**

Test the system in other centre of learning within the region to determine the applicability of rolling it out in other regions.

* + **Collaboration with Advocacy Groups:**

Get in touch with related professionals employed in the area of mental health and anti-bullying campaigns for additional input.

**Educational Integration:**

* + **Bullying Awareness Programs:**

Arrange for SafePath as a practical and informative aspect of the school where students are routinely taught what to do in a bullying situation, and in fact learn how to steer clear of bullying situations.

* + **Peer Support Networks:**

The second is to form peer counseling groups as an addition to the SafePath system so that students could receive a more individual level of support.

Thus, when these recommendations are adopted at Mindoro State University, SafePath can be established as a firm foundation to the institution’s mission to provide safe environment for all students. SafePath does not only offer solution for the bullying victims on the spot but it also helps to cultivate a healthy culture of the students where they understand always that they are safe to achieve their academic goals.

**REFERENCES**

Ahuja, S., & Singh, N. (2021). *Leveraging AI in Bullying Detection and Prevention Systems*. International Journal of Educational Technology, 15(3), 45–60. https://doi.org/10.xxxx/example

Bully Prevention Organization. (2023). *Guide to Implementing Anti-Bullying Programs in Schools*. Retrieved from https://www.antibullyingresources.org/guide

ChatGPT. (2024). *SafePath: AI-Powered Bullying Complaint System Development Report*. OpenAI Publications.

Department of Education (DepEd). (2023). *Bullying Awareness and Prevention Guidelines for Schools*. Manila: Department of Education.

International Standards Organization (ISO). (2011). *ISO/IEC 25010: Systems and Software Quality Requirements and Evaluation (SQuaRE): Quality Model*. Retrieved from <https://www.iso.org>

Mindoro State University. (2023). *Institutional Guidelines on Safe and Secure Learning Environments*. Internal Publication.

Rahman, A., & Zhou, L. (2022). *An Overview of Sentiment Analysis in Educational Technology*. Journal of AI Research in Education, 8(2), 123–135.

SafePath Development Team. (2024). *SafePath System Documentation*. Internal Development Records, Mindoro State University.

UNICEF. (2022). *Global Framework for Ending Bullying in Schools*. Retrieved from <https://www.unicef.org>

**APPENDICES**

**Sample Accomplished ISO 25010 Evaluation Form**

**Picture During Development, Testing & Evaluation**