Development of an Automated Message Writing Tool Assisted by Artificial Intelligence to Facilitate Communication between Students and Lecturers

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***Abstract*—This research project presents the development of Pesani, an innovative automatic messaging tool that harnesses Artificial Intelligence (AI) to offer suggestions on grammar, vocabulary, and writing style within messages. Pesani's primary objective is to enhance communication between students and lecturers participating in language literacy courses. The development process followed a well-structured Research and Development (R&D) methodology that incorporated iterative cycles to refine the tool. To ensure Pesani's efficacy and relevance, the research team collaborated closely with subject matter experts and media specialists. Their input was invaluable in shaping Pesani into a tool that not only functioned effectively but also met its users' specific needs. Validation conducted by subject matter and media experts has shown that Pesani is exceptionally well suited for its intended purpose. Furthermore, limited testing involving students has demonstrated that Pesani is highly effective in facilitating communication between students and professors. These results underscore Pesani's potential as an innovative solution to significantly enhance communication and improve student learning outcomes in language literacy courses.**

***Keywords*—Pesani, automatic messaging tool, Artificial Intelligence (AI), language literacy course**

I. Introduction

Effective communication between students and lecturers is pivotal for language literacy. It plays a vital role in facilitating information exchange, clarifying concepts, and promoting meaningful discussions [1]. Enhanced communication in this context can drive academic success and provide sustained academic literacy support tailored to a discipline. It is imperative for both students and lecturers to navigate online learning to foster the learning process effectively [2]. Particularly in the domain of English as a Foreign Language (EFL) teaching, the instructor's classroom English communication holds paramount importance in the teaching and learning of English [3]. Interpersonal communication between lecturers and students significantly influences their motivation and achievement of learning objectives [4]. However, the utilization of online learning technologies may inadvertently hinder interpersonal interactions and communication between students and lecturers [5].

The challenges faced by students in language literacy courses are often intertwined with their linguistic and general literacy backgrounds, attitudes towards academic writing, and favoring middle-class literacy practices [6]. Existing communication processes between students and lecturers in language literacy courses have several limitations. One such limitation in e-learning is insufficient support for students, especially concerning contacting lecturers and receiving timely feedback [7]. Traditional communication methods, such as email or in-person meetings, may prove inefficient or inaccessible, leading to delays and misinterpretation. Moreover, students' diverse linguistic backgrounds may hinder clear and accurate expressions in written messages, impeding effective communication and comprehension. Additionally, traditional communication methods often rely heavily on manual proofreading and editing, which can be time-consuming and subjective, posing challenges [8].

Strategies have been proposed to address these challenges, such as integrating academic literacy into disciplinary curricula, promoting multimodal teaching and assessment, and fostering collaboration between language lecturers and core course specialists. Effective communication between lecturers and students can create a conducive learning environment and boost academic achievement [9]. The lecturer-student relationship significantly affects students' motivation and overall learning experience [10]. Improved communication has several potential benefits, including heightened student engagement, deeper comprehension of course materials, and enhanced feedback and support from lecturers [11–13].

An effective solution to enhance communication between students and lecturers is to develop an Artificial Intelligence (AI)-powered automated messaging tool. The use of AI in education has attracted considerable attention and research interest. Previous studies have focused on their applications, challenges, and advantages. Chan and Zary [14] explored AI in medical education, highlighting its role in learning support, assessment, and curriculum development. They also discussed associated challenges, such as data privacy, ethical considerations, and their impact on educators and learners. Zhai *et al.* [15] identified four trends in AI studies from 2010 to 2020, touching upon benefits and concerns, changing roles, and social and ethical aspects. Bozkurt *et al.* [16] identified three key themes: adaptive learning, personalization, and expert systems, emphasizing the importance of a critical perspective when considering challenges and risks.

The objective of this study was to develop and evaluate the effectiveness of an automated message-writing tool known as Pesani. Pesani addresses these limitations by harnessing AI to provide real-time suggestions on grammar, vocabulary,

and writing style. The effectiveness of automated writing evaluation tools, similar to Pesani's, has been demonstrated in previous studies. Research has shown positive effects on students' writing skills when using such tools [17]. They offered students immediate feedback and suggestions for improvement, allowing them to refine their writing skills. Additionally, the integration of technology into the communication process has been shown to positively affect students' learning outcomes. Engaging lectures, which incorporate interactive elements and breaks for reflection or discussion, have been associated with higher average exam scores and improved long-term retention of information [18]. Similarly, web-enhanced instruction tools, such as Blackboard, have enhanced communication and interaction between students and instructors [19].

The research methodology employed for developing and evaluating Pesani is the Research and Development (R&D) method, specifically utilizing the Borg and Gall development cycle. This methodology encompasses ten stages that provide a structured approach to systematically develop and evaluate educational interventions. The R&D method aligns perfectly with the development and evaluation of educational tools, such as Pesani, ensuring their effectiveness and validity. The ten stages of the Borg and Gall development cycle encompass problem identification, conducting a needs assessment, establishing goals and objectives, designing the tool, developing and validating the tool, field testing, revising and refining the tool, implementation, evaluating effectiveness, and disseminating results [20]. This methodology allows researchers to systematically define, design, and develop Pesani while continually improving it based on feedback and evaluation. This approach ensured that the tool effectively caters to users' needs and expectations, with high validity scores indicating Pesani's effectiveness in assisting students and lecturers in improving their communication.

The evaluation of Pesani is crucial, encompassing content, language, presentation, and graphics to ensure its effectiveness and validity. The results of this evaluation play a pivotal role in determining the tool's potential to improve communication in language literacy courses. Content evaluation guarantees that the messages generated by Pesani are accurate, relevant, and aligned with the goals of effective communication, offering valuable suggestions and recommendations for enhancing message content [21]. Language evaluation focuses on the linguistic aspects of Pesani-generated messages and assesses their grammatical accuracy, vocabulary usage, and overall language clarity. By offering suggestions on grammar and vocabulary, Pesani helped students enhance their language skills and improve their written communication quality [22]. The real-time feedback and suggestions offered by Pesani can refine students' writing skills and improve their professional communication. Additionally, the tool enables lecturers to provide timely and efficient feedback, streamlines the feedback process, and offers comprehensive guidance to students [23]. This enhancement in communication fosters a supportive learning environment, reduces misunderstandings, and increases student engagement and academic performance [24–27].

In conclusion, the integration of Pesani into language literacy courses holds significant potential for enhancing communication between students and lecturers. The tool's assistance with grammar, vocabulary, and style improved the clarity and quality of the student-written messages. This streamlined communication and fostered a more engaging and interactive learning experience. Future research should explore Pesani's long-term effectiveness in various educational contexts, examine specific areas of improvement, and investigate its integration with other educational technologies and platforms. By doing so, we can unlock Pesani's full potential to revolutionize communication in language literacy courses and offer a seamless and integrated learning experience.

II. Literature Review

A. Effective Communication

Lowry *et al*. emphasized the impact of group size and social presence on small-group communication [28]. This suggests that smaller groups and face-to-face communication with computer-mediated support can enhance communication quality [29]. Pesani can facilitate effective communication within small groups by providing suggestions on grammar, vocabulary, and style, thereby improving the overall quality of communication. Tan *et al.* discuss the importance of interprofessional communication between nurses and physicians [30]. Although tools such as Pesani can assist in improving communication by providing language support, further research is needed to explore interventions that promote greater understanding and collaboration among health care professionals. Oxford *et al.* highlighted the role of writing assignments in promoting student engagement and communication skills [31]. Pesani can contribute by assisting students in writing effectively and providing real-time feedback, thereby enhancing their communication abilities. Rodliyah discussed the use of social media platforms, such as closed Facebook groups, to improve communication in educational settings [32]. Similarly, Pesani can be integrated with online platforms to enhance communication between students and lecturers, thereby providing a convenient and accessible tool for language literacy courses. Kieft *et al.* [32] emphasized the importance of writing strategies in improving students' learning outcomes [33]. Pesani can support students in developing effective writing strategies by providing suggestions and feedback, thereby enhancing their communication and writing skills. The literature also highlights the significance of communication in healthcare settings. Bittner et al. discussed the barriers and facilitators of communication between patients, caregivers, and physicians [34]. Pesani can assist in overcoming language barriers and improving communication between healthcare professionals and patients, leading to better healthcare outcomes. Overall, the literature review underscores the importance of effective communication in various educational and healthcare contexts. The findings of these studies support the potential benefits of using Pesani to improve communication in language literacy courses. By providing language support, feedback, and suggestions, Pesani can enhance students' communication skills, foster engagement, and improve their learning outcomes in language literacy courses.

B. Language Literacy Course

Several studies highlight the importance of professional development programs and interventions to improve

language and literacy instruction in educational settings [35–37]. These studies emphasize the role of effective teacher-child interactions, mentoring, and feedback in enhancing teaching practices and children's school readiness. Additionally, research has demonstrated the impact of digital tools and technology on language and literacy development [38–40]. The use of blogs, automated writing evaluation tools, and online platforms can enhance learners writing fluency, motivation, and critical thinking skills. These findings suggest that incorporating technology such as Pesani into language literacy courses can help students improve their writing skills and communication abilities.

Furthermore, the literature review highlights the significance of early literacy development and the role of effective communication in educational settings [41–43]. Studies have emphasized the importance of creating a language-rich environment, supporting teachers' professional growth, and promoting critical literacy education. Pesani can contribute to these goals by providing language support, feedback, and suggestions to both students and lecturers, thereby enhancing communication and literacy skills.

The literature also addresses the impact of computer anxiety, self-efficacy, and digital competence on language learning and satisfaction with online instruction [44–46]. These studies suggest that learners' technological skills, attitudes, and confidence play crucial roles in the successful implementation of digital tools and online learning environments. Understanding these factors can inform Pesani's integration into language literacy courses, ensuring that students and lecturers can effectively utilize the tool and maximize its benefits.

Moreover, the literature review explores the relationship between reading and writing skills in both first and second languages [47–49]. These studies highlight the interconnectedness of reading and writing abilities and the potential transfer of literacy skills across languages. Pesani can support students in developing their reading and writing skills by providing suggestions and feedback, ultimately enhancing their overall language literacy proficiency.

C. Automatic Messaging Tool

Cole-Lewis and Kershaw conducted a systematic review of the use of text messaging as a tool for behavioral change in disease prevention and management [50]. The review found that text messaging interventions can improve behavior and clinical outcomes. This evidence supports Pesani's potential to enhance students' communication and writing skills. Hasselmann and Birattari explored the automatic design of collective behavior for robots with local communication capabilities.

The results demonstrate the ability of automated systems to associate meaningful semantics with messages. This finding suggests that Pesani, an automated messaging tool, can provide valuable suggestions and feedback to students, thereby enhancing the clarity and coherence of their written messages. Zhang *et al.* discussed automation of literature screening using machine learning in medical evidence synthesis. This study highlights the benefits of automating systematic review processes, reducing workload, and improving efficiency. This automation can be applied to the evaluation and assessment of student messages, thereby allowing lecturers to provide timely and efficient feedback. Andrade *et al.* conducted a systematic literature mapping of approaches, tools, algorithms, and methods for automatic term extraction [51]. This study provides an overview of the development of automatic term extractors, highlighting the use of various algorithms and techniques. This research supports Pesani's potential to automatically identify and suggest appropriate vocabulary and terminology for students, thereby enhancing their language and writing skills. Overall, the literature review demonstrated the potential benefits and effectiveness of automatic messaging tools in various domains. The findings of these studies support Pesani's potential as an automated message-writing tool to assist students in improving their communication skills, enhancing their writing abilities, and providing timely feedback. By leveraging automated systems and algorithms, Pesani can contribute to more efficient and effective communication in language literacy courses.

III. Research Method

This study uses the research and development method with the Borg and Gall development cycle model. There are 10 stages of R&D developed by Borg and Gall [52]: (1) research and information collection, namely preliminary studies and field exploration; (2) planning, namely planning the prototype components to be developed; (3) initial product development stage, namely developing the initial prototype; (4) initial field testing, namely conducting external validation and limited testing; (5) main product revision, namely revising the results of limited testing; (6) main field testing, namely conducting field testing with a wider target audience; (7) operational product revision, namely revising the product based on field testing; (8) operational field testing, namely conducting detailed field testing; (9) final product revision, namely revising to improve the final product; and (10) socialization and implementation, namely implementing the module and socialization. Of the ten development stages used in this research, only up to stage 7, and simplified into four research stages: (1) preliminary study, (2) planning, (3) development, and (4) validation, revision, and limited testing. Of the ten development stages used in this study, only the first seven stages were used.The details of each stage are provided below.

1) Preliminary Studies: In Initial studies were conducted to determine the feasibility of the project. This includes creating an application plan that outlines the project objectives and identifying the key features of the application. By conducting a thorough analysis of project requirements, the team can ensure that the project is on track and that all necessary elements are included.
2) Planning: Once the preliminary studies were completed, the team moved to the planning stage. At this stage, the team creates a design for the application, analyzes the system, develops a user interface, and creates an application architecture. This stage is critical because it lays the foundation for the subsequent development stage.
3) Development: The development stage occurs when an actual application is built. The team writes the code, tests the application, fixes bugs, and creates the final product. This stage requires a significant amount of time

and resources and is crucial to the success of the project.

4) Validation, Revision, and Limited Testing: In the final stage, the team validates to ensure that the application meets the requirements and that it functions as intended. Based on user feedback, the team revised the application to address any issues that arose. The team then conducted limited testing to ensure that the application met the necessary release standards.

Product testing was conducted to collect the data used as a basis for determining the feasibility of the developed product. In this section, the aspects that need to be considered are (1) testing design, (2) testing subjects, (3) data types, (4) data collection instruments, and (5) data analysis techniques. Product testing design is divided into 2 stages, including media expert and material expert validation. Small-group testing determines the effectiveness of the application in learning and collects respondents' opinions.

Furthermore, large group testing was carried out to determine whether the teaching material in the Pesani application can be applied well and to obtain respondents' opinions about the application developed on a large scale. The subjects in this study were lecturers as media and material experts, as well as students in the Department of Language and Indonesian Literature at the State University of Padang, who took Language Literacy courses as testing subjects.

The types of data obtained were qualitative and quantitative, with quantitative data obtained from the assessment of the feasibility of the Pesani application by media and material experts in the form of a questionnaire, with scores ranging from 1 to 4. Qualitative data were obtained from interviews conducted with informants and validators. The data collection instruments used were interview guides, observation sheets, and questionnaires. Interviews and observations were conducted to analyze the need to develop the Pesani application. Questionnaires were administered to measure the validity of the Pesani application. Responses to the questionnaire used a Likert-scale measurement, with scores ranging from 1 to 4.

The scale was as follows: 1 = not good/not feasible/not happy, 2 = quite good/quite feasible/quite happy, 3 = good/feasible/happy, and 4 = very good/very feasible/very happy. A quantitative analysis was used to determine the feasibility of the developed application. The scores provided by media and material experts as responses to the questionnaire were used in a predetermined formula to determine the suitability of media. The formula is based on the scores given by experts and is analyzed quantitatively.

$$V = \frac{Tsa}{Ms} \times 100\%$$

V: Validity by percentage
Tsa: Total score achieved
Ms: Maximum score

The score data obtained from the test results were calculated using a percentage formula. After obtaining the percentage results from the calculations, the data were transformed into predicate statements and determined based on Table 1.

Table 1. Qualification criteria assessment measuring the validity level of eligibility

Indicator	Category	Information
1–50	Not feasible	Total revision
51–70	Less worthy	Major revision
71–85	Worthy	Minor revision
86–100	Very worthy	No revision

IV. Results and Discussion

In this section, we delve into the intricate process of developing the Pesani application, a dynamic tool designed to enhance communication between students and lecturers in the context of Language Literacy courses. It was prepared in three stages: initial study, planning, and development. During the initial study, the development team researched user needs and necessary features. During the planning stage, the development team designed the architecture and determined the workflow and features. Finally, in the development stage, the team codes, tests, and debugs applications. The preparation for creating The Pesani application is created using the following steps.

A. Preliminary Study

In the initial stage, the researcher conducted a preliminary study by interviewing several students who had taken an Indonesian Language Literacy course at Universitas Negeri Padang. The results of the interviews showed that many students had difficulty sending messages to their teachers in accordance with language rules. The factors that influenced these difficulties included a tendency to use informal language in messages, improper grammar usage, and lack of understanding of formal letter-writing rules. To understand the students' learning processes, the researcher conducted in-depth interviews and observed their learning activities. Some findings indicate that learning activities are generally limited to group discussions and presentations, which do not provide sufficient time for individual learning. Therefore, the researcher recommends the implementation of more varied and inclusive teaching methods, such as using technology in teaching or self-learning modules that can be accessed by students at any time. In addition, the researcher recommended the provision of more complete and easily accessible resources, such as reference books or digital libraries, to facilitate students in developing their literacy skills.

B. Planning

The product specification of the developed innovation in the form of a web application called Pesani can be used as an automatic message sender tool to facilitate communication between students and lecturers in the Indonesian Language Literacy course. This application can be accessed anytime and anywhere independently through the website www.pesani.my.id. The storyboard preparation consisted of several steps: naming the application, outlining the application content, designing the application features, and preparing the research instruments. The following are the results of storyboard preparation. First, we provide the name of the application. The name of the application is important because it serves as its identity. The name Pesani was obtained from this stage. Pesani is an abbreviation of Pesan Bahasa Indonesia (Indonesian Language Message). Next, we outline the content of the application. This stage designs what will be displayed in Pesani and how the menu order will be

presented. From this stage, the idea of the menu or content contained in Pesani was obtained. There 6 main menus in Pesani, arranged sequentially: (1) Create Message, (2) Quick Message, (3) Message Reference, (4) My Messages, (5) Sender Profile, and (6) Tetimonials. Third, research instruments must be developed. The Pesani Assessment Instrument for Media, Language, and Material Experts was developed. A user response questionnaire was used to test Pesani's effectiveness. The main design and menu of the Pesani application are shown in Figs. 1 and 2, respectively.

Fig. 1. Pesani design.

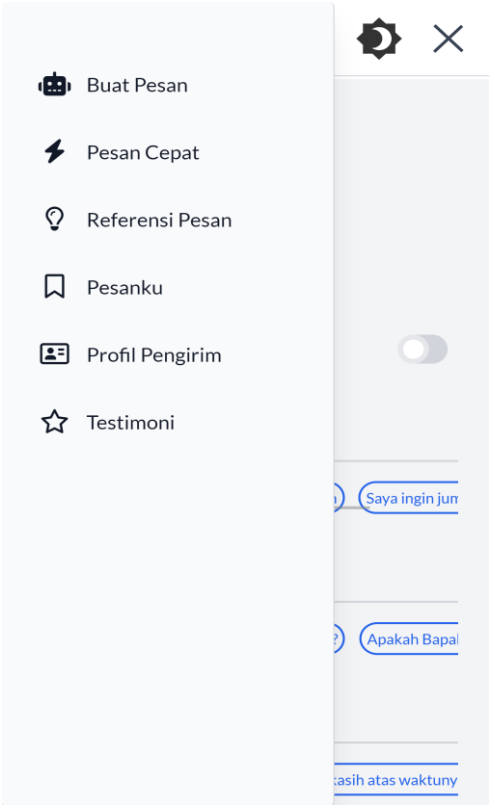

Fig. 2. Pesani menu.

C. Development

The development section explains that Pesani had five main menus designed in sequence. The application was developed using Vercel with the Tailwind CSS framework. The first was the Create Message menu. This menu is used to create a new message with the help of Artificial Intelligence (AI) that provides suggestions on grammar, vocabulary, and writing style. Second, Quick Message. This menu is used to quickly send short messages. The third is the Message Reference. This menu is used to view existing message templates, which users only need to copy. Fourth, My Messages. This menu was used to view and manage the sent messages. Fifth, Sender Profile. This menu was used to view and manage the sender's message profile. Finally, Testimonials. This menu was used to view feedback and reviews from users regarding Pesani. Each menu has its own function of facilitating communication between students and lecturers in language literacy courses. In application development, there are design and implementation stages for each menu that consider user needs and the availability of AI technology. The complete details are as follows.

1) Create message menu

The Create Message Menu is used to create a new message with the help of artificial intelligence (AI) that provides suggestions on grammar, vocabulary, and writing style. This menu consists of two columns: the "About Message" column and the "Message Result" column. The "About Message" column is used to enter the topic or content of the message to be written, while the "Message Result" column displays the message generated by AI. In the "Create Message" menu, Pesani utilizes Google Bard's AI assistance (https://bard.google.com/) to aid users in composing messages (refer to Fig. 3 and Algorithm 1). The algorithm used to generate the messages is as follows:

- Pesani will evaluate the topic or content of the message entered by the user.
- AI evaluates the topic or content of a message by matching it to the provided database.
- AI produces several sentence options that can be used in the messages.
- AI evaluates the sentence structure and words used in the sentence.
- AI will provide suggestions on the grammar, vocabulary, and writing styles that can be used in the message.
- Pesani will display the message result generated by AI in the "Message Result" column.

The integration of AI assistance into the Create Message menu of the Pesani application provides valuable support for users who may struggle to write messages effectively or efficiently. This feature offers suggestions on grammar, vocabulary, and writing styles and enhances the message generation process. Research has demonstrated the positive impact of AI-assisted writing tools on the quality of written communication. For example, a study conducted by Hughes *et al.* [53] found that students who used AI-assisted writing tools produced essays that were more organized, coherent, and persuasive than those written without AI assistance. This suggests that AI assistance in the Create Message menu of the Pesani application can significantly improve the overall quality of messages generated by users.

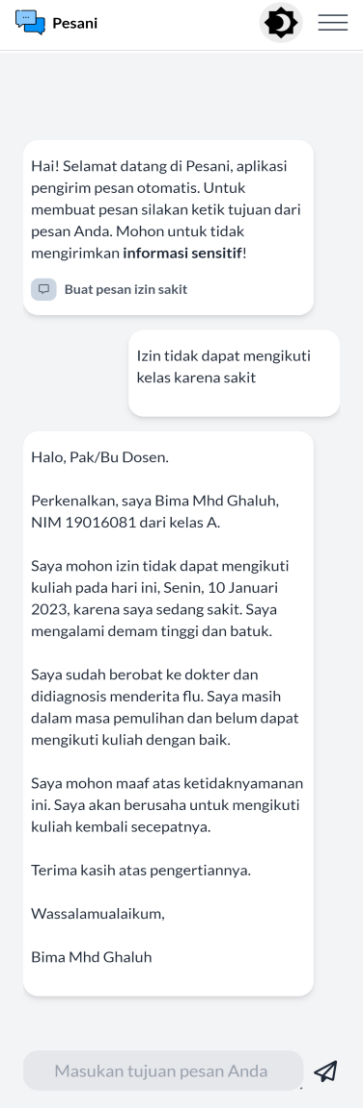

Fig. 3. Pesani create message menu.

Algorithm 1: Google Bard API

```
from flask import Flask, request
from bardapi import Bard
from dotenv import load_dotenv

load_dotenv()
bard = Bard(timeout=30)
app = Flask(_name_)

@app.route("/doll", methods = ["POST"])
def doll():
    if not request.json or 'prompt' not in
request.json:
        return "Bad request", 400
    prompt = request.json['prompt']
    response =
bard.get_answer(prompt)['content']
    return response
if _name_ == 'main':
    app.run()


curl --location 'https://api.pesani.my.id/doll'
\
--header 'Content-Type: application/json' \
--data '{
    "name": "Ahmad Zulfa",
    "student-id": "311455621",
    "class": "Informatika",
    "prompt": "Izin tidak dapat mengikuti kelas
karena jalan longsor"
}'
```

2) Quick message

The Quick Message Menu (Fig. 4) was used to quickly send a message to the lecturer. The content of this menu consists of several columns:

- Gender of the recipient lecturer (male/female)
- Use of greetings (optional)
- Purpose of contacting the lecturer
- Ask a question
- Thank you note

At the bottom of this menu are columns for Copying and Saving Messages as well as a button for Send Messages to the recipient lecturer's WhatsApp. With the Quick Message menu, it is hoped that users can send messages efficiently and effectively to lecturers without having to type detailed information.

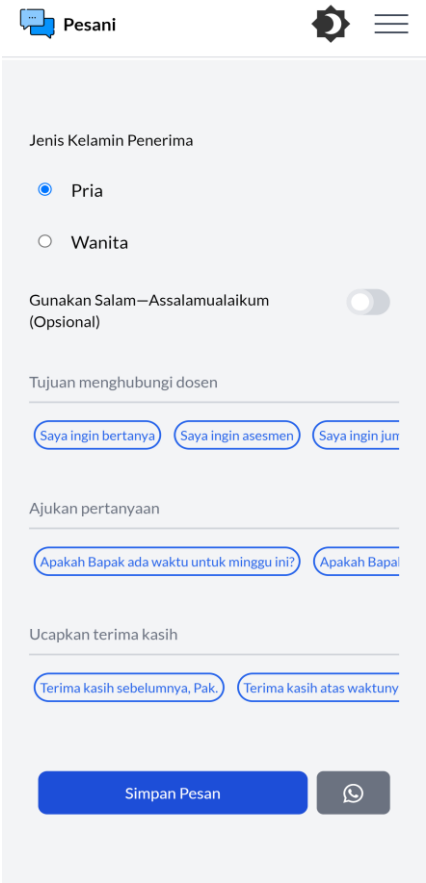

Fig. 4. Pesani quick message menu.

3) Message reference

The Message Reference (Fig. 5) menu is used to send messages using various templates. Some of the messages that can be used as references include those requesting sick leave, family matters, thesis guidance, and exam schedules. With these message templates, it is hoped that users can send messages more easily and quickly without having to create messages from scratch. In addition, message templates can help users write messages in correct and polite languages.

Fig. 5. Pesani message reference menu.

4) My messages

The "My Messages" Menu (Fig. 6) is used to store previously written messages for easy access in the future. Users can access these messages through two columns: "My Messages" and "Message Details." Additionally, a special column allows users to edit or delete messages that are no longer required. With this option, users can update messages before sending them again or clean their message boxes from irrelevant or unnecessary messages. This will help users become more productive and efficient when using the messaging feature on this platform.

Fig. 6. Pesani my message menu.

5) Sender profile

The Sender Profile Menu (Fig. 7) was used to display the sender's message profile. This menu consisted of three columns: Name, Student ID Number, and Class. This menu was intended to display the sender's profile when sending a message on the QuickMessage menu. These profile data are stored in a browser cookie; therefore, users do not need to register for the Pesani application every time they want to send a message.

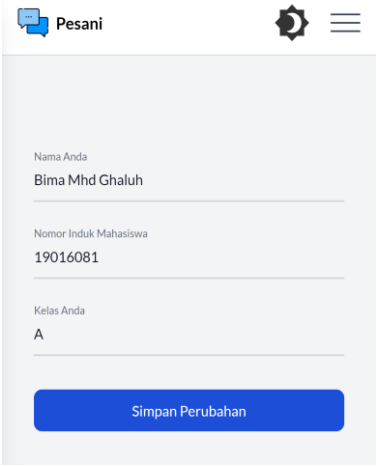

Fig. 7. Pesani sender profile menu.

6) Testimonials

The Testimonial Menu (Fig. 8) on Pesani contains reviews and testimonials from users who have used the Pesani application. When users submit a testimonial, they are asked to fill in their name and review it and the institution in which they are located. Before users can submit a testimonial, they are also asked to enter the Captcha code, which aims to prevent spam. The submitted testimonials are processed and reviewed by the developer before being published on the spreadsheet page managed by the development team.

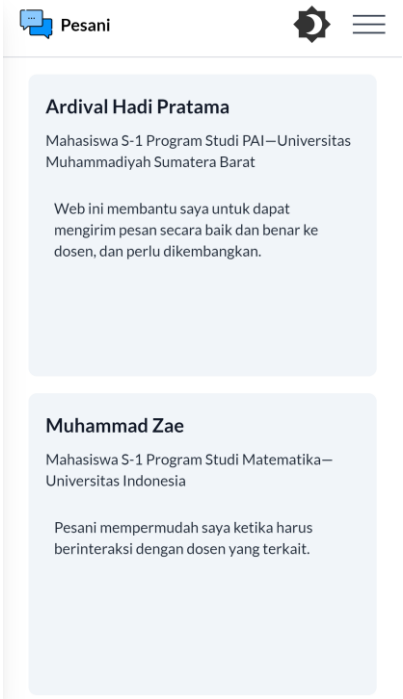

Fig. 8. Pesani testimonials menu.

D. Application Validation, Revision, and Limited Testing

Application validation, revision, and limited testing are efforts to achieve academic recognition. Validation was performed by testing the validity of the learning materials and media by involving experts in learning materials and media. The instrument used to obtain the validation data was a questionnaire containing an assessment sheet and a comment sheet. The assessment sheet contained a description of the aspects that needed to be assessed by the validator, and the evaluated aspects were adjusted according to the type of validation. Assessment was carried out by the validator by assigning a score between 1 and 4, where a score of 1 was for the category of very poor, a score of 2 was for less, a score of 3 was for good, and a score of 4 was for very good. The total score results were then presented by dividing the obtained score by the maximum score and multiplying by 100% (result score/maximum score × 100%). Material experts performed validations to determine the level of validity of the Pesani application. Here are the critical evaluation results of the material and media experts as shown in Table 2.

Table 2. Material and media expert assessment

Validator	Percentange	Category
Material expert validator	97%	Very worthy
Expert validator	90%	Very worthy
Averange	93.5%	Very worthy

Based on the assessment conducted by expert validators of the material, it was declared that the material is very good and can be used with minor revisions according to the suggestions and feedback provided. In addition, the validator highlighted that there were still some typing errors in the material that needed to be corrected for optimal results (see Table 3). However, overall, this material is suitable as a reference for sending messages.

Table 3. Material revision

No.	Material before Revision	Material after Revision
1	Typos and errors in the material need to be corrected.	Typos and errors in the material have been corrected for optimal results.
2	The Create Message menu needs improvement based on expert feedback.	The Create Message menu has been revised based on expert feedback to provide better suggestions on grammar, vocabulary, and writing style.
3	The name of the application is still tentative (Pesan Bahasa Indonesia)	The application's name has been finalized as "Pesani"

Overall, media expert validators stated that Pesani was good, interesting, and efficient. Therefore, Pesani can be used in some revisions. Limited testing was conducted on 100 students who had taken a Language Literacy course. Questionnaires were used to determine students' responses to Pesani. The students' opinions and responses to Pesani are shown in Table 4.

Table 4. Student's responses to Pesani

Student sample	Appropriateness %	Appropriateness Performance	Information
1	87	Very worthy	Makes the message sound more professional and easy to understand
2	85	Worthy	Provides writing suggestions that are easy to follow and useful
3	86	Worthy	Provides appropriate and useful sentence options
4	88	Very worthy	Provides proper and varied vocabulary suggestions
5	87	Very worthy	Provides useful suggestions for grammar and vocabulary
6	91	Very worthy	Provides creative and useful writing options
7	89	Very worthy	Makes the message sound more flowing and easy to understand
8	90	Very worthy	Provides consistent and useful writing suggestions
9	85	Worthy	Provides useful suggestions for grammar and vocabulary that are easy to follow
10	93	Very worthy	Provides unique and useful
11	95	Very worthy	Makes the message sound more professional, polite, and easy to understand
12	85	Worthy	Provides writing and grammar suggestions that are easy to follow and useful
13	96	Very worthy	Provides creative, appropriate, and useful vocabulary suggestions
14	94	Very worthy	Provides proper, clear, and useful writing suggestions
15	87	Very worthy	Makes the message sound more professional and formal
16	93	Very worthy	Provides good and useful grammar suggestions
17	97	Very worthy	Provides proper, varied, and useful vocabulary suggestions
18	89	Very worthy	Makes the message sound more flowing and easy to understand
19	91	Very worthy	Provides interesting and useful sentence options
20	97	Very worthy	Provides proper, consistent, and useful writing suggestions
21	93	Very worthy	Provides unique and useful vocabulary suggestions
22	97	Very worthy	Provides interesting, creative, and useful writing suggestions
23	96	Very worthy	Provides good, easy to understand, and useful grammar suggestions
24	93	Very worthy	Provides proper, useful, and clear writing suggestions
25	94	Very worthy	Provides proper, varied, and useful vocabulary suggestions
26	93	Very worthy	Provides useful sentence options
27	90	Very worthy	Provides useful writing suggestions that are easy to understand
28	88	Very worthy	Makes the message sound more polite
29	93	Very worthy	Provides interesting and useful vocabulary suggestions
30	93	Very worthy	Provides useful and interesting writing suggestions
31	97	Very worthy	Makes the message sound more formal and professional
32	97	Very worthy	Provides proper, varied, and useful vocabulary suggestions
33	87	Very worthy	Provides unique and useful writing suggestions
34	86	Worthy	Makes the message sound more professional and easy to read
35	85	Worthy	Provides useful writing suggestions that are easy to follow

36	95	Very worthy	Provides unique and useful sentence options
37	97	Very worthy	Provides proper, varied, and useful vocabulary suggestions
38	90	Very worthy	Provides useful writing suggestions that are easy to understand
39	90	Very worthy	Provides structured and useful writing suggestions
40	86	Worthy	Provides useful writing suggestions that are easy to follow
41	89	Very worthy	Makes the message sound more flowing
42	95	Very worthy	Provides proper, clear, and useful writing suggestions
43	97	Very worthy	Provides proper, varied, and useful vocabulary suggestions
44	86	Worthy	Makes the message easier to understand
45	88	Very worthy	Makes the message sound more polite
46	86	Worthy	Provides useful writing suggestions that are easy to follow
47	92	Very worthy	Provides clear and easy to understand writing suggestions
48	89	Very worthy	Makes the message sound more flowing
49	92	Very worthy	Provides proper and useful writing suggestions
50	92	Very worthy	Provides proper, varied, and useful vocabulary suggestions
51	87	Very worthy	Makes the message sound more formal
52	92	Very worthy	Provides creative writing suggestions
53	86	Worthy	Makes the message easier to understand
54	93	Very worthy	Provides unique sentence options
55	91	Very worthy	Provides useful grammar and vocabulary suggestions
56	89	Very worthy	Makes the message sound more flowing and natural
57	97	Very worthy	Provides proper, varied, and useful vocabulary suggestions
58	91	Very worthy	Provides consistent and useful writing suggestions
59	94	Very worthy	Makes the message sound more formal and polite
60	92	Very worthy	Provides proper, useful, and varied vocabulary suggestions
61	87	Very worthy	Makes the message easier to follow and more organized
62	92	Very worthy	Provides clear and useful grammar suggestions
63	89	Very worthy	Makes the message sound more professional and effective
64	95	Very worthy	Provides varied and unique sentence options
65	86	Worthy	Makes the message clearer and more structured
66	86	Worthy	Provides useful and beneficial writing suggestions
67	92	Very worthy	Makes the message sound more clear and easy to understand
68	96	Very worthy	Provides creative and useful vocabulary suggestions
69	91	Very worthy	Makes the message sound more polite and flowing
70	91	Very worthy	Provides clear and consistent writing suggestions
71	85	Worthy	Provides useful and beneficial grammar suggestions
72	85	Worthy	Makes the message clearer and more beneficial
73	87	Very worthy	Provides unique and beneficial writing suggestions
74	92	Very worthy	Makes the message sound more flowing and clear
75	94	Very worthy	Provides proper, varied, and useful vocabulary suggestions
76	86	Worthy	Makes the message clearer and easier to follow
77	96	Very worthy	Provides proper, rich, and useful writing suggestions
78	86	Worthy	Provides beneficial and easy to understand grammar suggestions
79	89	Very worthy	Makes the message sound more professional and beneficial
80	94	Very worthy	Provides proper, varied, and beneficial vocabulary suggestions
81	88	Very worthy	Makes the writing process easier and more effective
82	89	Very worthy	Provides creative and flowing writing suggestions
83	92	Very worthy	Makes the message sound more formal and flowing
84	92	Very worthy	Provides proper, varied, and useful grammar suggestions
85	96	Very worthy	Makes the message sound more rich and flowing
86	95	Very worthy	Provides unique and beneficial sentence options
87	87	Very worthy	Makes the message clearer and more flowing
88	90	Very worthy	Provides consistent and beneficial writing suggestions
89	94	Very worthy	Makes the message sound more polite and beneficial
90	90	Very worthy	Provides proper, varied, and consistent vocabulary suggestions
91	86	Worthy	Makes the message clearer and easier to understand
92	85	Worthy	Provides consistent and beneficial grammar suggestions
93	86	Very worthy	Helps me write messages better and easier to follow
94	94	Very worthy	Provides proper, varied, and beneficial vocabulary suggestions
95	92	Very worthy	Makes the message sound more professional and flowing
96	86	Very worthy	Provides easy to understand and varied writing suggestions
97	91	Very worthy	Makes the message sound more polite and beneficial
98	91	Very worthy	Provides proper, varied, and flowing vocabulary suggestions
99	94	Very worthy	Makes the message sound more formal and beneficial
100	91	Very worthy	Provides creative and beneficial writing suggestions
Averange	90.71	Very worthy	

Based on the limited trial analysis results, it can be concluded that the students responded positively to the Pesani application and were highly likely to use it. While previous studies have explored automatic messaging tools [50, 51, 54–56], none have specifically addressed the communication gap between students and lecturers. The development of the Pesani automatic messaging application fills a significant void in the existing literature on such tools. By focusing on improving student-lecturer communication, Pesani aims to enhance collaboration and efficiency within the Language Literacy course at the Department of Language and Indonesian Literature, Faculty of Language and Arts, State University of Padang. Future research should concentrate on evaluating Pesani's effectiveness and impact on enhancing student-lecturer communication and research practices. This assessment can involve surveys, interviews, and usage data analysis to gather insights into the application's usability, effectiveness, and overall influence on student-lecturer communication. Furthermore, qualitative research methods, such as focus groups and case studies, can provide deeper insights into user experiences and perceptions regarding the application's features, benefits, and limitations. Conducting such research will yield valuable insights to refine and enhance Pesani's application, ultimately leading to improved student-lecturer communication and research practices in the digital age.

V. Conclusion

In summary, our research demonstrates that the Pesani application is a valuable asset in Language Literacy courses, supported by the high validation scores from experts and positive student feedback. Beyond its immediate benefits, its implementation aligns with sustainable educational goals by reducing resource consumption. Theoretical implications highlight its relevance to language acquisition, while practical applications empower educators to enhance students' communication skills and inclusivity. Future research should explore the long-term effectiveness and integration with other educational technologies, promising a brighter future for language education.

Conflict of Interest

The authors declare no conflict of interest.

Author Contributions

Yenni Hayati, Bima Mhd Ghaluh, and Ella Wulandari developed the research concept by identifying the problem, designing the study, analyzing the data, and writing the article. Nursaid and Yulianti Rasyid carried out the data analysis process and article writing. Meanwhile, Muhammad Adek and Bowo Pratama played a role in collecting data and interpreting research findings. All authors have approved the final version.

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