Development of an Academic and Professional Context-Based BIPA Module for Vocational Education Integrated with QR Code Technology

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Abstract. This study developed an A1-level Indonesian for Foreign Speakers (BIPA) module designed around academic and professional communication in vocational education and supported by QR Code technology. The study employed a Research and Development (R&D) design based on the 4D model, comprising Define, Design, Develop, and Disseminate. The needs analysis involved 10 respondents, while the development process was reviewed by 10 validators consisting of BIPA, vocational education, instructional media, and syntax experts. The practicality assessment was completed by the same 10 validators, and a limited trial involved six beginner-level BIPA learners. The findings showed that the identified learning needs reached an overall score of 89%, while expert validation produced a mean score of 4.5, categorized as Very Valid. The practicality assessment obtained 88%, categorized as Very Practical. In the limited trial, the mean learner score increased from 65 to 82; this result was interpreted as preliminary evidence rather than statistical evidence of effectiveness. The resulting nine-unit module integrates listening, speaking, reading, and writing with academic, practical, campus-related, and digital communication contexts, supported by QR Code-linked audio and video resources. The module provides an alternative contextual and technology-supported resource for BIPA instruction in vocational education.

Keywords: 4D Model, BIPA, Module Development, QR Code, Vocational Education

1 Introduction

In higher education, BIPA instruction contributes to the broader use of Indonesian by preparing non-native learners to communicate in Indonesian academic and professional environments. Beyond everyday communication, BIPA learning can also introduce learners to Indonesian culture, institutional practices, and academic settings (Maranta et al., 2023). The increasing movement of international learners across higher education institutions has consequently created a need for instructional materials that are responsive to specific learning contexts. Existing BIPA materials, however, tend to

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emphasize general communication and do not always address the academic and professional communication required in vocational education (Puspita et al., 2021; Sari & Ansari, 2021). Because vocational education connects classroom learning with practical tasks and field-specific interaction, BIPA materials for this setting need to provide language input that is relevant to authentic academic and professional situations.

Contextual language instruction can make learning more meaningful by linking classroom activities with situations that learners are likely to encounter in real communication (Handayani & Nurlina, 2024). For BIPA learners in vocational education, such situations may include academic interaction on campus, laboratory or practical activities, and communication related to future professional settings. At the same time, digital technology provides opportunities to extend learning beyond printed materials through the combination of textual, auditory, and visual resources. Multimedia-based learning can support learners' understanding by presenting information through complementary modes (Mayer, 2020), while technology-enhanced learning environments can provide more flexible access to learning resources (OECD, 2021). In this study, QR Codes are used as a practical link between the printed module and supplementary digital materials, particularly audio and video resources.

Recent BIPA studies have explored the use of digital and multimedia resources to enrich language learning. Examples include audiovisual materials, interactive learning modules, and technology-supported resources for communication-oriented instruction (Febrianti et al., 2021; Maranta et al., 2023 ; Sucipta et al. 2025). These developments indicate that digital media can broaden opportunities for learners to engage with language through multiple forms of input and to practice language in more contextual settings. However, the existing studies largely address general communication or specific cultural contexts rather than systematically combining academic and professional communication within vocational education. This limitation indicates a research gap concerning the development of a BIPA module that brings together vocationally relevant contexts, multimodal learning resources, and QR Code technology within a single instructional design.

The module design draws on three complementary theoretical perspectives. Learner autonomy provides a basis for encouraging learners to take responsibility for accessing and managing learning resources independently (Little, 2004*;* Little, 2016). Communicative competence, meanwhile, emphasizes the appropriate use of language in relation to social and situational contexts (Canale & Swain, 1980; Farquhar, 1992). Multimedia Learning Theory further informs the presentation of learning materials by emphasizing the value of combining verbal and visual forms of information to support comprehension (Booth, 2006; Mayer, 2001). Together, these perspectives inform the integration of academic and professional communication contexts, the four language skills listening, speaking, reading, and writing and QR Code-linked multimodal resources within the module.

Accordingly, this study focuses on the development of an A1-level BIPA module for vocational education that incorporates academic and professional communication contexts and QR Code technology. The module is intended to provide authentic language activities across listening, speaking, reading, and writing while allowing

learners to access supplementary audio and video materials independently. The study also examines the module through needs analysis, expert validation, and practicality assessment. Through this development, the study seeks to provide a contextual and technology-supported instructional resource that responds to the communication needs of BIPA learners in vocational education.

2 Methodology

This research followed a Research and Development (R&D) design to produce a BIPA module tailored to academic and professional communication in vocational education and supported by QR Code technology. The development process referred to the 4D model of Thiagarajan et al. (1974) and Widanta et al. (2023), covering Define, Design, Develop, and Disseminate. The Define stage identified learner and instructor needs, reviewed the curriculum, and mapped relevant academic and professional communication situations. The Design stage translated these findings into the module structure, contextual materials, four language skills, and QR Code-linked audio and video resources. During the Develop stage, the prototype was reviewed by 10 experts, comprising four BIPA experts, three vocational education experts, two instructional media experts, and one syntax expert. The same 10 evaluators assessed the module's practicality, while six beginner-level BIPA learners participated in the limited trial. The final stage, Disseminate, involved product refinement, scientific publication, and dissemination to BIPA instructors (Borg & Gall, 2003; Sugiyono, 2019).

Data were obtained from a 20-item needs analysis questionnaire, a 17-item expert validation questionnaire, a practicality questionnaire, semi-structured interviews, observation, documentation, and a limited pretest-posttest. All questionnaires employed a four-point Likert scale. The needs analysis questionnaire was completed by 10 respondents: five BIPA learners, two prospective A1-level non-native learners, and three BIPA instructors. Reliability analysis using Cronbach's alpha produced coefficients of 0.907 for the needs analysis questionnaire and 0.782 for the expert validation questionnaire. Semi-structured interviews were conducted to obtain more detailed information on user needs (Kallio et al., 2016), while observation and documentation supported the description of the development and trial processes.

Data were interpreted using qualitative descriptive analysis. Interview, observation, documentation, and validator feedback were examined through the interactive model of Miles, Huberman, & Saldaña (2014), involving data reduction, data display, and conclusion verification. Questionnaire findings were summarized using mean scores and percentages to describe the module's needs, validity, and practicality. No inferential statistical analysis was applied. The resulting scores were interpreted using the validity criteria of Akbar (2017) and the percentage categories of (Riduwan, 2015).

3 Results and Discussion

3.1 Results

Needs Analysis. The needs analysis involved 10 respondents representing three user groups: BIPA learners (50%), prospective A1-level foreign learners (20%), and BIPA instructors (30%).

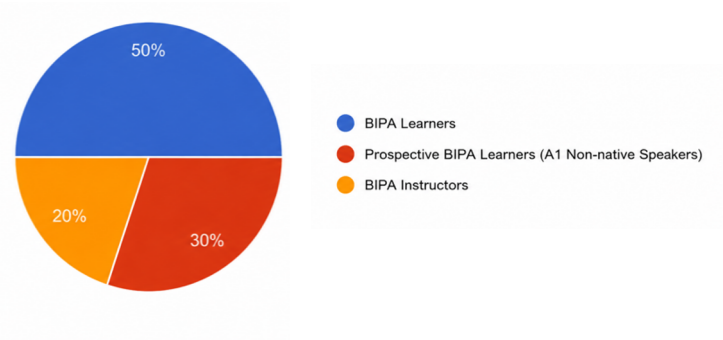


Figure 1. Needs Analysis Respondents

The respondent composition was intended to capture perspectives from both current and prospective learners as well as instructors, providing a broader basis for identifying BIPA learning requirements in vocational education.

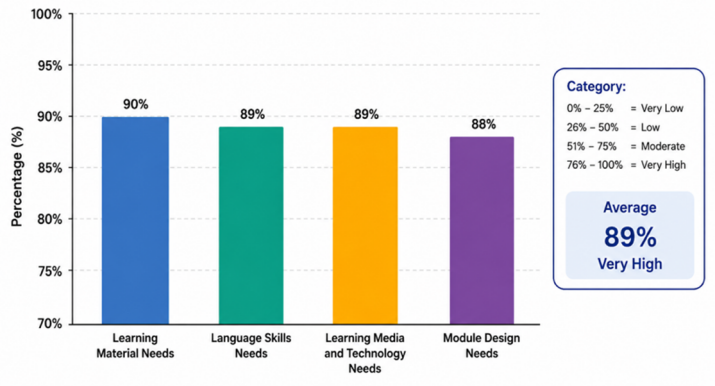


Figure 2. Results of the BIPA Learning Needs Analysis

Figure 2 summarizes the identified needs across four areas: learning materials, language skills, media and technology, and module design. The corresponding percentages and categories are presented in Table 1.

Table 1. Results of the BIPA Learning Needs Analysis

No	Needs Analysis Aspect	Percentage (%)	Category
1	Learning Materials	90%	Very High
2	Language Skills	89%	Very High
3	Media and Technology	89%	Very High
4	Module Design	88%	Very High
	Average	89%	Very High

The four aspects were rated Very High, with an overall percentage of 89%. Learning materials recorded the highest result (90%), followed by language skills and media and technology (89% each), while module design reached 88%. The results highlight the need for learning materials that combine academic and professional communication, integrated language skills, QR Code-supported digital resources, and a clear instructional structure. These requirements subsequently guided the design of the BIPA module.

Module Design. Based on the needs and curriculum analyses, the module was organized into nine learning units covering academic, practical, campus-related, and digital communication contexts relevant to A1-level BIPA learners. The units progress from basic introductions and campus interactions to practical activities, presentations, campus services, and communication with lecturers through WhatsApp. Each unit contains learning objectives, instructional materials, language activities, and QR Codes linking the printed module to audio and video resources. This structure provides contextual and multimodal learning while allowing learners to access supplementary materials independently. An example of the module design and QR Code integration is presented in Figure 3.



Figure 3. Module Design and QR Code Integration

Expert Validation. Expert validation was conducted before the module implementation and involved 10 validators: four BIPA experts, three vocational education experts, two instructional media experts, and one syntax expert. The

validators assessed the module in four aspects: content suitability, language, presentation, and media integration, including the QR Code component.

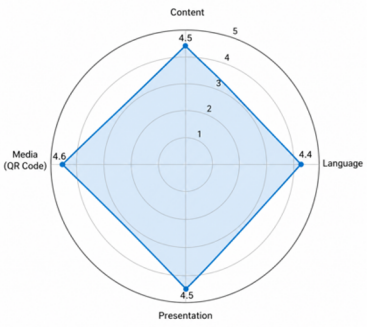


Figure 4. Expert Validation Results

Figure 4 summarizes the validation results across the four assessment aspects, with detailed scores presented in Table 2.

Table 2. Expert Validation Results

Assessment Aspect	Mean Score	Category
Content Suitability	4.5	Very Valid
Language	4.4	Very Valid
Presentation	4.5	Very Valid
Media (QR Code)	4.6	Very Valid
Average	4.5	Very Valid

The validation results show that all four aspects were rated Very Valid, with an overall mean score of 4.5. Media integration, including the QR Code component, received the highest score (4.6), followed by content suitability and presentation (4.5 each), while language received 4.4. These results indicate that the module met the expected criteria for content, language, presentation, and media quality. Feedback from the validators was subsequently used to refine the module before implementation.

Practicality Testing. The same 10 validators also completed the practicality assessment using the practicality section of the validation instrument.

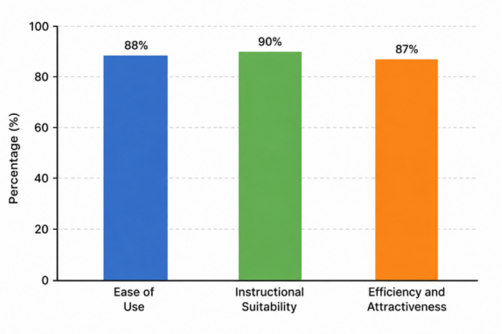


Figure 5. Practicality Evaluation Results

Figure 5 summarizes the practicality assessment across three aspects: ease of use, instructional suitability, and efficiency and attractiveness. The results are detailed in Table 3.

Table 3. Practicality Evaluation Results

Assessment Aspect	Percentage Score (%)	Category
Ease of Use	88%	Very Practical
Instructional Suitability	90%	Very Practical
Efficiency and Attractiveness	87%	Very Practical
Average	88%	Very Practical

The practicality assessment resulted in an overall score of 88%, categorized as Very Practical. Instructional suitability received the highest score (90%), followed by ease of use (88%) and efficiency and attractiveness (87%). The percentage represents the proportion of the total score obtained relative to the maximum possible score on the four-point Likert scale, rather than the proportion of respondents selecting the "Very Practical" option. The results indicate that the module has a clear instructional structure and that its QR Code integration facilitates access to supplementary audio and video materials. Overall, the module was considered practical for BIPA instruction in vocational education.

Limited Trial. The limited trial involved six beginner-level BIPA learners and was conducted to obtain preliminary evidence of the module's use in learning. A pretest was administered before instruction, followed by a posttest after the learners completed the learning activities using the module. The results were treated as descriptive supporting data rather than as evidence of statistical effectiveness.

Table 4. Pretest and Posttest Results

Category	Mean Score
Pretest	65
Posttest	82
Improvement	+17

As shown in Table 4, the mean score increased from 65 in the pretest to 82 in the posttest, representing a 17-point descriptive increase. This result provides preliminary evidence of improved learner performance following the instructional activities. However, because the trial involved only six learners and did not include a control group or inferential statistical analysis, the finding should not be interpreted as evidence of the module's statistical effectiveness. Rather, it provides an initial indication that the module has potential to support BIPA learning in vocational education. The findings were subsequently considered in the final refinement of the module before broader dissemination.

3.2 Discussion

Needs Analysis. The needs analysis indicates that vocational BIPA learners require instructional materials that integrate learning content, language skills, digital technology, and systematic module design. The high level of need across these aspects suggests that BIPA instruction in vocational education should extend beyond general language knowledge to support language use in authentic academic and professional situations. This finding supports contextual language learning, which emphasizes communication situations that are relevant to learners' needs (Handayani & Nurlina 2024; Maranta et al., 2023; Sari & Ansari, 2021). The integration of digital resources is also relevant to learner autonomy because it provides learners with additional opportunities to access and manage learning materials independently (Little, 2004; Little, 2016).

Module Design. Based on the needs and curriculum analyses, the module was organized into nine learning units covering key academic, practical, and campus-related communication situations in vocational education. The units progress from basic introductions and campus interactions to practical activities, presentations, campus services, and digital communication through WhatsApp. The four language skills and QR Codes linking the printed module to audio and video resources are integrated throughout the units. This design supports contextual, interactive, and autonomous learning and is consistent with Multimedia Learning Theory (Mayer, 2020) and the OECD (2021) recommendation for technology-enhanced and adaptive learning.

Module Development and Validation. The developed module was rated as very valid and very practical, indicating that it met the criteria for content validity, language appropriateness, instructional presentation, and media quality. The involvement of experts in BIPA, vocational education, instructional media, and syntax supported the alignment of the module with the characteristics of vocational education. The limited trial showed an increase in mean learner scores from 65 to 82. However, because the trial involved only six learners and did not include a comparison group or inferential statistical analysis, this increase should be interpreted as preliminary evidence rather than statistical evidence of effectiveness. The finding suggests that integrating academic and professional contexts, the four language skills, and QR Code-supported multimodal resources has potential to support BIPA learning. This finding is consistent

with Zawacki-Richter et al. (2019), who highlighted the role of digital technology in enhancing learner engagement and learning experiences. It also demonstrates the value of a systematic 4D development process in producing instructional materials that are valid and practical (Thiagarajan et al., 1974); Sugiyono, 2019).

Dissemination. The dissemination stage involved finalizing the module based on expert validation and limited trial results, followed by scientific publication and dissemination to BIPA instructors. This stage was intended to broaden the use of the module and obtain feedback for future improvement (Sugiyono, 2019).

Research Contribution. The findings demonstrate that the QR Code-integrated BIPA module based on academic and professional contexts achieved high levels of validity and practicality. These findings reinforce previous studies showing that context-based instructional materials can enhance the relevance of language learning (Handayani & Nurlina, 2024), while digital technology can support learning quality and learner engagement (Mayer, 2020; OECD, 2021; Zawacki-Richter et al., 2019).

Unlike previous studies that have primarily focused on general communication contexts or local cultural content (Maranta et al., 2023), this study integrates three components within a single instructional module: academic and professional contexts, multimodal learning, and QR Code technology. The main contribution of this study therefore lies in providing a BIPA instructional module that addresses the needs of foreign learners in vocational education and supports communication in both academic and professional settings.

Nevertheless, this study has limitations related to the small number of participants in the limited trial and the implementation of the module on a limited scale. Future research should involve more diverse learner populations and broader instructional contexts to examine the applicability of QR Code-integrated BIPA modules based on academic and professional contexts.

4 Conclusion

This study successfully developed an A1-level BIPA module based on academic and professional contexts and integrated with QR Code technology using the 4D development model. The module was rated as very valid and very practical, while the limited trial provided preliminary evidence of its potential to support BIPA learning. The integration of academic and professional contexts, the four language skills, and QR Code-enabled multimodal learning resources represents the main contribution of this study to BIPA instructional materials for vocational education. Future research should involve larger and more diverse groups of learners to obtain broader evidence and evaluate the module's applicability and effectiveness in BIPA instruction.

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