A DESIGN FRAMEWORK FOR DIGITAL CULTURE-BASED INTEGRATIVE INDONESIAN LANGUAGE MATERIALS TO ENHANCE LITERACY

Nguyen Thi Thu Hang
Ho Chi Minh Open University Vietnam
*Correspondence Email: hang.ngtt@ou.edu.vn

ABSTRACT

Digital transformation has created new opportunities for innovation in Indonesian language teaching and learning while also requiring the integration of linguistic, cultural, and digital competencies into BIPA learning-material design. This study proposes an integrated design framework for culture-based Indonesian language learning materials in digital environments, focusing on linguistic, intercultural, and digital competence among intermediate BIPA learners. The study adopts an Educational Design Research (EDR) approach and uses a structured literature review and thematic synthesis to identify relevant theoretical principles and design requirements. Drawing on intercultural communicative competence, digital competence, the Cognitive Theory of Multimedia Learning, and the integration of technology, pedagogy, and content, the study proposes the Integrated Culture-Digital BIPA Materials Design Framework (ICD-BIPA). The framework connects learning needs, learning outcomes, language and culture, digital learning activities, assessment, and literacy outcomes. It provides a theoretical foundation for future material development, expert review, pilot testing, and empirical evaluation, while supporting the broader implementation of SDG 4 in digital education.

KEYWORDS

BIPA; digital competence; intercultural competence; educational design research; digital learning materials

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INTRODUCTION

Digital transformation has created significant changes in how teaching and learning activities are organized and implemented in higher education. In this environment, digital technologies not only broaden access to learning resources but also reshape how learners search for, process, interact with, and construct knowledge. Consequently, digital competence is increasingly viewed as an important component of learning competence in

higher education. A systematic review by Zhao et al. (2021) shows that research on digital competence in higher education increasingly emphasizes the intentional application of technology in learning and academic activities rather than viewing digital competence simply as the ability to operate technical tools.

This shift requires innovation not only in teaching methods but also in the design of learning materials. In digital environments, learning materials need to move beyond information delivery to facilitate learner interaction, practice, the use of multimedia resources, and self-regulated learning. In foreign-language education, learning materials should simultaneously support language development and the ability to use language within particular social and cultural contexts. An intercultural approach emphasizes that language education should not focus only on linguistic accuracy but should also develop learners' ability to recognize, interpret, and engage with cultural differences in communication (Byram & Wagner, 2018). Therefore, culture should be treated as a pedagogical component of foreign-language learning-material design rather than as supplementary information.

The need to integrate language and culture is particularly important for Indonesian for Foreign Speakers (Bahasa Indonesia bagi Penutur Asing, BIPA). Indonesian is learned in close relation to diverse cultural settings, in which the meanings of many linguistic expressions are connected to social norms, values, and cultural practices. Research on methods and challenges in BIPA teaching also indicates that the organization of Indonesian language instruction for foreign learners needs to consider learner characteristics, teaching methods, and the cultural context of the target language (Fitria, 2023). Therefore, BIPA learning materials need not only to provide linguistic input but also to create contexts that help learners understand and use Indonesian in culturally meaningful communication situations.

Recent studies have begun to explore this approach through the development of culture- and technology-driven BIPA learning materials. Muzaki (2024), for example, developed online BIPA Level 5 learning materials using the ADDIE model, organizing content around themes related to life, culture, and Indonesian society while incorporating goals for developing the four language skills. More recent research by Purlilaiceu et al. (2025) further integrated Banten culture with the TPACK approach in BIPA curriculum development, showing that combining cultural content, pedagogical knowledge, and technology can create interactive learning materials that support learners' intercultural understanding. In addition, research on foreign learners' needs for interactive digital BIPA materials indicates that factors such as digital interactivity and cultural relevance are related to learners' needs when using such materials (Martriwati et al., 2026).

Although these studies indicate that the integration of language, culture, and technology is receiving increasing attention, current approaches still largely focus on the development or evaluation of particular learning materials, proficiency levels, cultural content, or technologies. For example, Muzaki (2024) focused on online materials for BIPA Level 5, whereas Purlilaiceu et al. (2025) focused on a curriculum based on Banten culture. These studies provide important evidence regarding the feasibility of digital and culture-based BIPA materials, but they also indicate the need for further research at the design-framework level, where language, intercultural, and digital competence goals are systematically identified and connected.

At the intermediate BIPA level, learners need to move from using basic communicative expressions to reading, writing, discussing, presenting, and interpreting more complex content. Therefore, learning materials should not only provide linguistic knowledge but also create tasks that help learners use language in cultural contexts, compare and interpret cultural phenomena, and use digital resources to support learning.

Designing learning materials in an integrated manner can establish relationships among linguistic competence, intercultural competence, and digital competence.

Therefore, this paper aims to propose a framework for designing culturally integrated Indonesian language learning materials in digital environments for intermediate BIPA learners. The framework is guided by three main components: (1) linguistic competence, (2) cultural/intercultural competence, and (3) digital competence. Within this framework, technology is treated as a means of learning development.

This approach supports learners in accessing information, interacting with cultural content, and engaging in language learning rather than pursuing technology as an independent goal. It is aligned with research trends in digital competence in higher education and builds on recent findings concerning the development of online and culture-based BIPA learning materials.

Based on these considerations, the study focuses on two objectives: (1) to identify requirements for designing integrated, culture-based BIPA learning materials in digital environments; and (2) to propose a design framework capable of connecting language, cultural/intercultural, and digital competence goals for intermediate learners. The study contributes theoretically and practically to BIPA learning-material development in the context of digital transformation and provides a reference for designing integrated, contextual, and competence-oriented foreign-language learning environments.

REVIEW OF RESEARCH AND THEORETICAL FOUNDATIONS

SDG 4 and the Orientation toward Quality Education in Digital Environments

Sustainable Development Goal 4 (SDG 4) defines education in terms of quality, equity, and inclusion while promoting lifelong learning opportunities for all. However, "quality education" in SDG 4 should not be understood only through access to education or outcome indicators; it should also be considered in relation to educational goals, content, organizational methods, and the ability to meet diverse learner needs. Boeren (2019) argues that SDG 4 needs to be approached at the micro, meso, and macro levels, where quality education is linked to the specific conditions and contexts of learning processes.

An important component of SDG 4 is lifelong learning. Elfert (2019) shows that incorporating lifelong learning into SDG 4 broadens the scope of education from formal education to learning opportunities that occur across different contexts and stages of life. This is especially relevant in digital environments because technology can facilitate more flexible access to learning materials in terms of time, place, and mode of learning.

In relation to technology and SDG 4, Costa et al. (2024) argue that EdTech has the potential to support quality education by expanding accessibility, improving teaching and learning processes, and creating learning environments that are more responsive to learner needs. However, the contribution of technology to SDG 4 depends on how the technology is designed and implemented within educational systems rather than on the technology itself. Therefore, this study does not treat SDG 4 as a research variable but as a value orientation and contextual foundation for learning-material development. Digital BIPA learning materials should aim to create high-quality, flexible, and competence-oriented learning experiences. This provides a basis for shifting the question from "whether to use technology" to the more important question of how technology should be integrated into learning materials to improve the quality and relevance of foreign-language learning.

Digital Transformation and Foreign-Language Education

Digital transformation in education is not merely the process of converting printed materials into electronic formats; it also involves changes in the design, organization, and

experience of learning activities. Zhao et al. (2021), in their systematic review of digital competence in higher education, show that much current research approaches digital competence through the ability to use technology to perform learning and academic activities. Notably, the reviewed studies frequently use components derived from DigComp to describe and assess digital competence.

In foreign-language education, digital transformation substantially expands sources of language input and opportunities for learner interaction. Learning management systems, online learning, multimedia resources, and interactive tools enable learners to access language in diverse contexts. However, using multiple technologies does not necessarily create an effective learning environment. Moreno and Mayer (2007) show that multimodal learning environments are effective when elements such as guided activities, feedback, learner control, and reflective activities are integrated into instructional design.

In particular, e-learning can create new opportunities for higher education and support the goals of SDG 4. Maphosa et al. (2023) indicate that e-learning can support education in developing-country contexts, but large-scale implementation continues to be influenced by conditions related to infrastructure, accessibility, and instructional organization. Therefore, in this study, learning management systems, multimedia, and AI are not treated as independent components of the framework. They are viewed as technological tools that can be selected according to learning objectives and the characteristics of the learning materials.

This approach avoids a common limitation in digital-education research: equating "innovation" with adding as much technology as possible to teaching processes. In this study, innovation is defined in terms of how technology is integrated into the pedagogical design of BIPA learning materials.

Digital Learning Materials and Learning Experience Design

Digital learning materials can be understood more broadly than as simple electronic documents. They constitute a system of resources, content, activities, and interaction methods designed to support learners in achieving learning objectives in digital environments. Hartog et al. (2012) emphasize that the design of digital learning resources in higher education should simultaneously consider design requirements, implementation, usability, and the context of use.

An important foundation for digital learning-material design is the Cognitive Theory of Multimedia Learning (CTML). Mayer (2024) argues that multimedia learning is based on learners' processing of information through multiple symbolic channels and their active selection, organization, and integration of information to construct knowledge. This theory provides a basis for designing combinations of text, images, audio, video, and other forms of representation rather than relying on a single element.

This does not mean simply increasing the number of media elements in learning materials.

Previous empirical research also indicates that an appropriate combination of verbal and visual information can support learning processes and knowledge transfer more effectively than presenting information in a single form (Mayer, 1997).

From this perspective, digital BIPA materials need to be designed according to purposeful multimodal principles. Cultural videos, images, sounds, texts, and interactive activities should not appear as decorative elements but should serve specific linguistic or cultural objectives. This is the basis for directing BIPA materials toward an integrated digital-learning approach in which content, media, and activities are designed as a unified learning experience.

Culture-Based Language Learning and Intercultural Communicative Competence

The relationship between language and culture is a fundamental foundation of foreign-language education. Byram and Wagner (2018) argue that contemporary foreign-language teaching needs to go beyond the provision of linguistic knowledge and prepare learners to interact with people from different cultures. Therefore, language learning should include the knowledge, skills, and attitudes required for intercultural communication.

A key aspect of this approach is that culture is not viewed as a separate component from language. Instead, culture becomes the context in which language is used and given meaning. This is particularly important for BIPA because Indonesian-language learners simultaneously encounter Indonesian communication styles, social norms, values, and cultural practices.

Recent BIPA research strengthens this argument. Muzaki (2024) developed online BIPA Level 5 learning materials covering topics such as natural disasters, historical landmarks, Indonesian cuisine, short stories, discussions, poetry, and national heroes; the lessons simultaneously targeted the four language skills and integrated content related to knowledge about Indonesia.

More importantly, Purlilaiceu et al. (2025) developed a BIPA curriculum based on Banten culture using the TPACK approach. The study showed that combining local cultural content with technological and pedagogical knowledge can create interactive and relevant learning materials that support learners' intercultural understanding.

From these studies, it can be concluded that cultural/intercultural competence needs to be embedded in BIPA learning-material design rather than simply added as a separate "Indonesian knowledge" component or a stand-alone cultural reading. In this study, each learning-material unit should establish a relationship among the language being learned, the cultural context, the communicative task, and reflective activities.

Integrated Learning Materials: From Skills Integration to Language-Culture-Technology Integration

The concept of integrated learning materials in this study is developed from the perspective that foreign-language learning materials should create relationships among different elements of the learning process rather than organize them into separate units. At the language level, integration can be expressed by connecting listening, speaking, reading, and writing within the same topic or task. At the content level, linguistic knowledge is placed within a cultural context. At the technology level, digital resources are selected to support cognitive and communicative activities.

The online BIPA Level 5 learning-material development study by Muzaki (2024) is an example of integration at the skills level: each unit includes objectives, pre-learning activities, content, exercises, grammar, vocabulary, and knowledge about Indonesia while targeting the four language skills. However, this approach mainly demonstrates integration within the structure of the materials.

Meanwhile, Purlilaiceu et al. (2025) extend integration by combining content, pedagogy, and technology through TPACK. The value of this approach lies in positioning technology in relation to content and pedagogy rather than adding technology after content has already been designed.

Based on these studies, this paper extends the concept of integration into four layers:

(1) language-skills integration — listening, speaking, reading, and writing;

(2) cultural integration — language is situated within cultural and communicative contexts;

(3) technology integration — technology supports reception, interaction, product creation, and self-directed learning;

(4) assessment integration — assessment activities are connected to the competencies targeted by the learning materials.

Therefore, learning materials are considered "integrated" not merely because they contain many components, but because those components have functional relationships with one another and are all directed toward the same intended outcomes.

Digital Competence and the Role of DigComp in Learning-Material Design

Digital competence is the third component in the research framework, alongside linguistic competence and cultural/intercultural competence. Zhao et al. (2021) show that DigComp is one of the most widely used frameworks for studying digital competence in higher education.

DigComp 2.2 defines digital competence through five main domains: (1) information and data literacy; (2) communication and collaboration; (3) digital content creation; (4) safety; and (5) problem solving.

The framework simultaneously emphasizes the knowledge, skills, and attitudes required for individuals to participate confidently and critically in digital environments.

For BIPA, not all components of DigComp need to be integrated directly into learning materials to the same extent. Instead, this study selects competencies that are directly relevant to language-learning processes, such as:

Finding and evaluating digital information in Indonesian;

Interacting and collaborating in digital environments;

Using multimedia resources;

Creating digital content in Indonesian;

Problem solving in self-directed learning.

This approach helps transform digital competence from an external theoretical objective into a component that can be developed through the language-learning process itself. In other words, learners do not merely "learn Indonesian through technology"; they also develop digital competence through meaningful use of Indonesian in digital environments.

This point is also consistent with recent studies measuring digital competence using DigComp 2.2, in which the competence framework is adapted to specific contexts rather than applied mechanically. For example, Kwaah et al. (2026) show that the structure of DigComp 2.2 can be validated and adapted to particular learner groups and educational contexts.

Synthesis of the Theoretical Foundations and Research Gap

From the studies above, three mutually supporting theoretical layers can be identified for this research.

First, SDG 4 and digital-education theory provide macro-level guidance: learning materials should contribute to creating learning opportunities that are high quality, flexible, and competence oriented. Research on EdTech and SDG 4 indicates that technology can support educational quality, but its effectiveness depends on how it is integrated into pedagogical processes.

Second, intercultural communication theory provides a foundation for identifying culture as an intrinsic component of foreign-language education. According to Byram and Wagner (2018), language education should prepare learners to interact and engage in dialogue across different cultural contexts.

Third, DigComp and multimedia-learning theory provide a basis for determining how learners use and interact with digital resources. Technology in learning materials is not a stand-alone component; it needs to be designed to align with learners' cognitive, communicative, and product-creation activities.

When these three theoretical layers are situated in the BIPA context, recent research shows significant development: Muzaki's (2024) online BIPA Level 5 materials, Purlilaiceu et al.'s (2025) TPACK-based local-culture BIPA materials, and studies of digital and culture-based learning materials. However, these studies have mainly focused on specific products or learning contexts.

Therefore, the gap addressed by this study is not the absence of digital BIPA materials or culture-based BIPA materials in general. The gap lies in the limited availability of a systematic design framework that defines the relationships among language objectives, cultural/intercultural content, digital activities, multimedia, and assessment within one learning-material design, particularly for intermediate BIPA learners.

RESEARCH METHODOLOGY

This study uses Educational Design Research (EDR) to develop a framework for proposing integrated and culture-based Indonesian language learning for intermediate BIPA learners in digital environments. EDR is appropriate because it enables theoretical foundations to be connected with the development of practical educational design solutions (Design-Based Research Collective, 2003; McKenney & Reeves, 2012).

The research process was conducted in five steps. First, a structured literature review was undertaken to identify and systematize studies related to digital education, SDG 4, digital competence, cultural/intercultural competence, multimedia learning, and BIPA learning-material development. Second, the selected studies were analyzed and synthesized using thematic synthesis to identify recurring themes and design elements directly related to the research objectives (Thomas & Harden, 2008). Third, these elements were integrated into a conceptual design framework focused on three core dimensions: language competence, cultural/intercultural competence, and digital competence, while identifying relationships among cultural content, language activities, multimedia resources, and digital-learning activities. Fourth, the framework underwent expert review by specialists in BIPA, language education, and digital education to assess the relevance, clarity, consistency, and feasibility of its elements. Finally, expert feedback was used to refine the framework and improve its structure and design principles. This process follows the logic of EDR, in which analysis, design, evaluation, and adjustment are interconnected to produce a design product with theoretical strength and practical value (McKenney & Reeves, 2012).

PROPOSED INTEGRATED DESIGN FRAMEWORK

Based on a synthesis of research on digital education, intercultural communication, multimedia learning, and BIPA, this study proposes the Integrated Culture-Digital BIPA Learning Materials Framework (ICD-BIPA). The framework was developed according to design-research logic, in which theoretical elements are transformed into design principles and structures applicable to educational practice (Design-Based Research Collective, 2003).

Design Principles

The framework is built on five principles: learner-centeredness, cultural grounding, digital integration, integrative design, and sustainability. First, learner-centeredness places

BIPA learners' needs, proficiency level, and capacity for self-directed learning at the starting point. Second, cultural grounding views Indonesian culture not as supplementary content but as a context in which learners use and interpret language. Third, digital integration requires technology to be selected according to pedagogical objectives rather than used as decoration. This perspective is consistent with TPACK, in which technology is positioned in relation to content and pedagogical methods (Mishra & Koehler, 2006). Fourth, integrative design connects language, cultural/intercultural, and digital competencies within the same learning process. Finally, sustainability aims to enable learning materials to be reused, updated, and expanded within digital environments, consistent with the quality-education and lifelong-learning orientation of SDG 4.

Framework Components

The framework consists of six connected components arranged in the design sequence: Learning needs → Learning outcomes → Language and culture → Digital learning activities → Assessment → Literacy outcomes

Learning needs define learners' levels and requirements; learning outcomes translate those needs into specific objectives; language and culture integrate linguistic content with Indonesian cultural contexts; digital learning activities provide opportunities for learners to receive, interact with, apply, and create products; assessment evaluates competence development simultaneously; and literacy outcomes represent the final outputs consisting of language literacy, cultural/intercultural literacy, and digital literacy.

This structure is based on the view that educational design should create relationships among theory, design products, and learning practice (Design-Based Research Collective, 2003). At the same time, the use of text, images, sound, and video should be intentionally organized to support learners in selecting, organizing, and integrating information, in line with the Cognitive Theory of Multimedia Learning (Mayer, 2024).

Learning-Material Structure

Based on the components above, a BIPA learning-material unit can be organized in the following sequence:

Learning outcomes → Contextual warm-up → Authentic cultural input → Vocabulary & grammar → Integrated language tasks → Intercultural reflection → Digital activities → Assessment → Learning reflection

This structure ensures that cultural content, language knowledge, and digital activities do not stand alone but are connected in a learning cycle. For example, a video about Indonesian food culture can serve as input for learners to identify vocabulary, analyze language structures, discuss Vietnam–Indonesia differences, search for further information in Indonesian, and finally create a digital product. In this way, cultural content simultaneously becomes language input, a communicative task, and an opportunity to develop digital skills.

Digital Learning Features

Digital tools such as interactive quizzes, discussion forums, digital storytelling, e-portfolios, multimedia resources, and AI-supported feedback are treated as optional tools depending on learning objectives. The framework does not assume that more technology automatically produces higher-quality learning materials. According to Mayer (2024), multimedia design needs to consider the limitations of information processing and learners' active cognitive processing; therefore, every digital element should have a clear learning function.

Accordingly, the novelty of this framework lies not in adding more technology to BIPA materials but in integrating technology, culture, and language within a coherent design system. The framework aims to produce two simultaneous outcomes in the learning process: developing language competence together with cultural/intercultural literacy and digital literacy. This also provides a basis for the framework to contribute to innovation in foreign-language education in digital environments and to SDG 4 — Quality Education.

DISCUSSION

Theoretical Contribution

The findings indicate that the Integrated Culture-Digital BIPA Learning Materials Framework extends BIPA learning-material design from organizing linguistic content toward an integrated model of linguistic, cultural/intercultural, and digital competencies. This approach is consistent with the design-based research perspective, which states that educational design products should be developed through relationships among theory, design, and learning practice (Design-Based Research Collective, 2003).

The first contribution of the framework is the identification of culture as a structural component of foreign-language learning materials rather than merely illustrative content. This perspective is consistent with Byram and Wagner (2018), who emphasize that language education should aim to support intercultural communication and dialogue. In the BIPA context, research by Syamsi et al. (2024) also affirms the inseparable relationship between language and culture in developing meaningful learning materials. Therefore, the proposed framework does not position "culture" and "language" as two independent content categories but organizes them within the same context of communication and learning tasks.

The second contribution concerns digital competence. Research in higher education shows that digital competence is increasingly regarded as an important component of learning competence, with DigComp being one of the commonly used reference frameworks for defining dimensions of digital competence (Zhao et al., 2021). On this basis, the framework does not view technology only as a means of transmitting learning materials but integrates information-search, interaction, information-processing, and digital-content-creation activities into Indonesian language learning itself. This creates a shift from "learning Indonesian with technology" toward "developing language and digital competence through meaningful use of Indonesian in digital environments."

The third contribution is the connection between multimedia learning-material design and learning objectives. According to Mayer (2024), effective multimedia learning depends on learners' ability to select, organize, and integrate information under conditions of limited cognitive-processing capacity; therefore, adding more media does not automatically produce higher-quality learning. Accordingly, this framework does not prescribe fixed technologies but defines pedagogical functions for digital resources: videos, images, audio, online interaction, or content-creation tools are selected only when they support language, cultural, or digital competence objectives.

Relationship to Previous BIPA Learning-Material Development Research

The proposed framework inherits and extends findings from previous BIPA learning-material development research. Muzaki (2024) developed online BIPA Level 5 learning materials using ADDIE, in which lessons combined objectives, activities, vocabulary, grammar, the four language skills, and knowledge about Indonesia. Research by Purlilaiceu et al. (2025) further integrated local culture and technology through TPACK in BIPA curriculum development.

Compared with these approaches, the contribution of the present study lies not in creating a new type of BIPA curriculum or introducing new technology into learning materials. Its focus is to generalize design elements into a framework that can guide the development of various types of learning materials. Whereas previous studies focused more on what kinds of materials should be developed, this framework focuses on the question of which principles and relationships should guide the design of integrated digital BIPA materials. This represents a shift from product-oriented material development toward design-oriented framework development.

Practical Implications

Practically, the framework can serve as a blueprint for instructors and BIPA learning-material developers when designing learning units. Instead of beginning with the selection of digital tools, designers can begin with competence objectives, select appropriate cultural content, define language tasks, and then select suitable digital media. This approach helps maintain consistency among learning outcomes, learning activities, digital resources, and assessment.

Specifically, the framework can support BIPA material design at the intermediate level, where learners need to move from using basic sentence patterns and communication situations toward expressing ideas, processing information, discussing socio-cultural topics, and creating more independent language products. This is also consistent with current trends in online BIPA material development, where research has begun to integrate language skills, cultural content, and digital learning environments.

The framework can also be adapted for other foreign languages. However, transferability should be understood at the level of design principles rather than as a direct copy of content. Core elements such as language-culture-digital integration can be retained, while cultural content, linguistic characteristics, learner proficiency levels, and digital tools need to be adapted to each context.

Contribution to SDG 4

The framework is directly related to SDG 4 at the level of educational orientation. Rather than treating SDG 4 as a variable to be measured, the study approaches SDG 4 as a guiding principle for designing quality learning opportunities in digital environments. Integrating linguistic, cultural/intercultural, and digital competencies facilitates learning materials that not only provide knowledge but also support learners in developing the competencies required to learn and participate in digital environments.

In particular, research on digital competence in higher education shows that educational institutions need appropriate strategies and learning tools to develop learners' digital competence and improve educational quality (Zhao et al., 2021). From this perspective, the proposed framework can be viewed as a micro-level contribution to educational design in support of the broader direction of SDG 4: translating quality education and learning competence in digital environments into specific principles for learning-material design.

Limitations and Directions for Further Research

This study has several limitations that should be considered. First, the current framework is based on a synthesis of theory and previous research and therefore cannot be regarded as empirical evidence of its effectiveness on BIPA learners' learning outcomes. Second, although the framework components are grounded in existing theoretical foundations and BIPA research, the framework needs to be tested further across different learner populations and programs. Third, rapidly evolving digital technologies mean that the design framework needs to remain updateable rather than depend on particular tools.

Therefore, further research should follow three steps: (1) expert validation to assess the framework's appropriateness and feasibility; (2) pilot development and implementation to translate the framework into specific BIPA learning materials; and (3) empirical evaluation to examine the impact of the materials on learners' language, cultural/intercultural, and digital competencies. This development direction is consistent with the nature of Educational Design Research, in which design, implementation, evaluation, and adaptation are conducted as a continuing process to generate practical solutions and design knowledge (McKenney & Reeves, 2020).

CONCLUSION

This study began with the need to innovate BIPA learning-material design in the context of digital transformation, where material development can no longer focus only on providing language content but also needs to address cultural understanding and the ability to participate in digital environments. Based on a synthesis of research on digital education, digital competence, intercultural communication, multimedia learning, and BIPA learning-material development, this study proposes the Integrated Culture-Digital BIPA Learning Materials Framework with three main competence components: language competence, cultural/intercultural competence, and digital competence.

The core of the framework is the view that language, culture, and technology are functionally interconnected components of the same learning design rather than stand-alone supplementary content. Thus, cultural content provides a context for communication; language activities help learners acquire and use language; and digital resources expand access, interaction, and product-creation opportunities. Assessment is further designed to reflect the simultaneous development of the targeted competencies. This approach builds on recent trends in online and culture-based BIPA material development while extending them to the framework-design level.

Academically, the study provides an integrated approach to BIPA learning-material design by connecting language learning, intercultural learning, and digital learning within a unified design structure. Practically, the framework can serve as a basis for developing and evaluating digital BIPA materials at the intermediate level and may be adaptable to other foreign-language education contexts. However, the framework is currently a theory-based design proposition rather than a validated model. Expert review, experimental material development, and empirical evaluation are the next steps needed to determine its applicability.

Therefore, the main value of this study does not lie in claiming that technology itself improves the quality of foreign-language teaching and learning, but in proposing a principled approach for integrating technology into learning-material design while keeping learner competence development as the primary goal. In this respect, the framework can contribute at the micro-design level to the broader objective of SDG 4 — Quality Education while laying a foundation for further research on the development, implementation, and validation of BIPA materials in digital environments.

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