

## Development of Jiapu Puzzle Interactive Media for Learning Chinese Cultural Kinship System

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### Abstract

This study aims to develop an interactive learning media called *Jiapu Puzzle* to support students' understanding of the kinship system in Chinese culture, which is a crucial component of Mandarin language education. The media was developed using the ADDIE model, which includes analysis, design, development, implementation, and initial evaluation stages. Development involved classroom observations of grade XI IBB students at SMA Laboratorium UM, teacher interviews, and validation by media and content experts. The final product is a family tree puzzle board representing kinship structures on both paternal and maternal sides, complete with narratives and Hanzi illustrations. Validation results showed that the media was highly feasible in terms of visual appeal, content quality, and usability. The implementation stage revealed positive student responses, especially in terms of engagement, enthusiasm, and comprehension. Using a conventional gamification approach, *Jiapu Puzzle* proved effective as an alternative medium to support engaging and contextual Mandarin language and cultural learning.

**Keywords:** *JiaPu Puzzle, Interactive learning media, Chinese culture, Kinship system, Mandarin language learning, Learning Media*

### Introduction

Mandarin language learning has become an important aspect of foreign language education, especially amidst the increasing demand to master a globally influential language. Beyond functioning as a tool for communication, Mandarin also serves as a window to understand and appreciate one of the world's oldest civilizations (Chen, 2023). Therefore, Mandarin instruction must include mastery of the four core language skills: speaking, listening, reading, and writing. This aligns with the view of Waeu et al. (2022), who argue that foreign language teaching, including Mandarin, should be designed in an integrative manner so that listening, speaking, reading, and writing are not taught in isolation but rather complement each other in real communicative contexts. Hence, effective and contextual approaches are necessary to enable students to acquire the language comprehensively and meaningfully.

In addition to language skills, learners also need to understand linguistic knowledge such as grammar, vocabulary, and culture. Culture is an inseparable element in learning Mandarin because it encompasses the values, norms, and practices that shape communication and social interaction in Chinese society. This is in line with the explanation by Lukman and Nida

(2023), who state that language and culture are closely interconnected language represents culture, and both form an essential unity in intercultural learning processes in Mandarin classrooms. Thus, cultural learning is a vital component. Farhaeni and Martini (2024) also emphasize the importance of cultural understanding, asserting that language and culture are interlinked and mutually influential. Therefore, integrating cultural aspects into Mandarin learning not only enriches students' understanding but also helps them master the language more deeply and contextually.

During the process of learning Mandarin at school, students often face several challenges. Based on the researcher's observation during the Teaching Assistance (Asistensi Mengajar/AM) program at SMA Laboratorium UM on September 19, 2023, students encountered difficulties in understanding kinship structures in Mandarin. The differences in kinship terms between the paternal and maternal sides for example, 爷爷 [yéye] for paternal grandfather and 外公 [wàigōng] for maternal grandfather caused confusion among students, making it difficult for them to distinguish and understand that Mandarin uses different terms depending on family lineage. Furthermore, interviews with the Mandarin teacher at SMA Laboratorium UM confirmed that students struggle with these distinctions because they do not empirically experience such kinship structures in their own culture. This difficulty highlights the need for instructional media that can assist students in understanding these concepts more easily.

To address students' difficulties, there is a need for instructional media that can bridge the gap in understanding Mandarin kinship terms. Instructional media play an important role in supporting the learning process, especially those that are interactive and contextual. Etyarisky and Marsigit (2022) argue that interactive media based on contextual approaches are effective in improving students' conceptual understanding. Similarly, Saputro et al. (2020) emphasize that appropriate media can encourage active student engagement and help them comprehend material more easily and enjoyably. In Chinese cultural learning, visual and manipulative media such as puzzles can help students grasp family structure concepts that are unfamiliar in the Indonesian context.

When learning about Chinese culture particularly the concept of the kinship system interactive media can serve as an effective tool to illustrate family structures and relationships that may not be commonly known in Indonesia. Cultural understanding is also a key component of language learning. Farhaeni and Martini (2024) note that cultural awareness not only helps students master the language but also fosters appreciation for cultural differences. In this context, understanding Chinese kinship systems allows students to learn specific terms while also gaining insight into how Chinese society values family relationships and individual roles within them.

Cultural understanding is a crucial element in language education. The concept of family in Chinese culture is not merely biological but also structural and philosophical. Rošker (2020) explains that the Confucian kinship system forms the foundation of social order, giving rise to relationalism the idea that individuals are understood within a network of social relations. Values such as filial piety, reverence for ancestors, and role-based responsibilities according to generational hierarchy are integral parts of Confucian ethics. This suggests that studying Chinese kinship systems enables students to learn culturally specific terms while appreciating how Chinese society upholds family roles and responsibilities. This perspective aligns with Syaputri et al. (2021), who emphasize the importance of integrating cultural elements into language education, as it broadens students' perspectives and increases their sensitivity to diverse cultural values, particularly within the Indonesian educational context.

As an effort to help students understand kinship terms in Mandarin, the researcher developed the JiaPu Puzzle as instructional media. This media is designed to make learning about the Chinese kinship system more interactive and enjoyable. JiaPu (家谱), or family tree, depicts family structure in a diagrammatic form.

The JiaPu Puzzle not only engages students in learning but also assists them in better understanding family relationships in Chinese culture. According to Yu et al. (2021), puzzle games are effective in language learning because of their engaging nature. Hasanah Lubis et al. (2023) also state that engaging media tailored to students' characteristics can enhance learning outcomes. Visual and manipulative learning tools like puzzles create enjoyable learning environments while reinforcing students' memory of the concepts taught. Hofmeyr (2019) also asserts that puzzles with information-gap activities promote interaction, negotiation of meaning, and communication strategies that support second language acquisition. Additionally, Sit et al. (2024) demonstrate that puzzle games can enhance children's linguistic intelligence through word-building and vocabulary recognition activities.

Previous studies also support the effectiveness of puzzle-based learning media. Research by Wahyuni and Prasetyo (2021), titled "Development of Puzzle Media to Improve Elementary Students' Understanding of Science Concepts", shows that puzzle media effectively help students grasp material concretely and enjoyably, while also increasing active participation. This study used the R&D method to produce engaging and applicable classroom media.

Similarly, research by Mariana and Astuti (2020), titled "Effectiveness of Interactive Puzzle Media in Indonesian Language Learning to Improve Students' Reading Skills", used an experimental method and demonstrated that interactive puzzle media significantly improved students' reading abilities and text structure comprehension. The media was also found to be engaging and easy for students to use in learning activities.

Moreover, Sari and Nugraheni (2023), in their study "Development of Digital Puzzle Media in Learning Mathematics on Fractions" using the ADDIE approach, proved that digital puzzle media can increase learning motivation and facilitate conceptual understanding of mathematics through visual and interactive methods. These studies underline the positive impact of puzzle-based media on student engagement and comprehension.

While existing studies have highlighted the benefits of puzzle media in learning, they have mostly focused on general applications and have not explored the use of puzzles in teaching Chinese kinship concepts despite the fact that understanding cultural elements is essential for deepening students' learning, particularly in relation to politeness and respect.

This research differs from previous studies by specifically developing the JiaPu Puzzle, a learning media that not only takes the form of a puzzle but also integrates Chinese cultural values. To date, no studies have been found that develop puzzle-based media with this specific cultural integration approach. Therefore, this study is expected to contribute to the development of culturally based instructional media in Mandarin language learning, particularly at the secondary education level. Considering the urgency of the identified problem, this study aims to develop the JiaPu Puzzle media focusing on understanding kinship systems in Chinese culture and to obtain student responses toward the media. The JiaPu Puzzle is designed using a visual and game-based approach to help students understand the differences in Mandarin family terms particularly those between the paternal and maternal sides in a more contextual and enjoyable way. This media is expected to foster understanding, increase student interest, and promote active engagement in learning Mandarin language and culture, while also introducing the cultural values embedded within.

## Method

This research is a development study that utilizes the ADDIE model as a systematic framework. The ADDIE model consists of five phases: Analysis, Design, Development, Implementation, and Evaluation. This model was first introduced by the Center for Educational Technology at Florida State University in 1975 as part of a training project for the United States military (Molenda, 2003). It was later popularized by Dick and Carey and further developed by Reiser and Molenda due to its emphasis on analyzing the interrelation and coordination among components at each stage of development.

In the analysis phase, the researcher conducted observations and interviews with Ms. Windi Amalina, the Mandarin language teacher for Grade XI IBB at SMA Laboratorium UM, on September 19, 2023, to identify students' learning problems and analyze their needs particularly in understanding the differences in kinship terms between the paternal and maternal sides in Chinese culture. On the same day, the researcher also conducted classroom observation in Grade XI IBB to assess students' understanding of the subject matter through field notes and documentation.

The design phase involved constructing the initial concept of the media based on the kinship system in Chinese culture. During this phase, the researcher compiled a vocabulary list related to family members and designed short narratives to be used as part of the game activities. The framework for the puzzle design and game rules were also developed at this stage as a foundation for further media development.

The development phase included the realization of the design into a physical learning media product. The media developed consists of an A3-sized puzzle board illustrating a family structure, complete with color elements, images, Hanzi characters, and Pinyin. Each puzzle piece can be attached according to the correct kinship position, thereby helping students to understand family structures in a concrete manner. The media was then validated by two experts one subject matter expert and one media expert. The validation process aimed to assess content relevance, visual feasibility, and alignment with student characteristics.

The implementation phase of the JiaPu Puzzle media was carried out in the Grade XI IBB class at SMA Laboratorium UM. The implementation aimed to observe student engagement while using the media and to gather their responses. Apart from serving as a trial run, this implementation also functioned to identify the strengths and weaknesses of the media prior to revision in the evaluation phase.

However, this study was conducted only up to the implementation stage due to time constraints. As a result, more extensive testing and follow-up evaluation procedures could not be carried out, leaving areas such as in-depth evaluation and media revision after implementation as opportunities for future research. Therefore, the focus of this study is on the development of the media, its initial application, and the acquisition of preliminary insights into student responses and the usability of the media.

## Results

### 1. Analysis

The analysis phase was conducted by observing the Mandarin language learning process at SMA Laboratorium UM during the 2023/2024 academic year, specifically on September 19 and September 21, 2023, in the Grade XI IBB class during a lesson on family-related

vocabulary. This analysis was divided into two parts: needs analysis and content analysis. It was carried out through direct classroom observation and interviews with the Mandarin language teacher. The results of these observations and interviews served as the foundation for developing the learning media.

According to the teacher's statement during the interview:

"Students are often confused when distinguishing family terms in Mandarin, especially when it comes to differentiating between paternal and maternal relatives. They are not familiar with such family structures, so sometimes the terms get mixed up or forgotten. Perhaps this is because there hasn't been any learning media used—I've only explained it orally."

This observation was reinforced by a student (pseudonym: X), who stated:

"I don't really understand, because in my family we don't use terms like this to refer to our relatives."

It was evident that the students were unfamiliar with the distinct terms used to refer to family members in Mandarin and were only encountering such concepts during their high school studies.

During the second meeting on September 21, 2023, the Grade XI IBB students gave presentations on family trees they had created. During these presentations, observational data showed that the majority of students were confused when answering questions posed by the teacher. The pre-research analysis indicated that students struggled to distinguish these kinship terms and to comprehend the hierarchical nature of family relationships that are characteristic of Chinese culture. This difficulty stemmed from the fact that the Chinese family structure is more complex than the Indonesian one, and students had not empirically experienced the dual distinctions in kinship lines present in Chinese culture.

This cultural gap affected students' understanding of the social structure and cultural values embedded within the Chinese kinship system. As part of formative evaluation in this phase, the researcher held a discussion with a supervising lecturer to reflect on the findings from the observations and interviews. The evaluation concluded that the problems identified were significant and appropriate to serve as the foundation for the development of instructional media.

## **2. Design**

The second phase involved the design of interactive instructional media aligned with the family-related content in Mandarin, based on the issues identified during the preliminary analysis phase. In this phase, the researcher designed the layout of the puzzle board, cards, and packaging using thumbnail sketches. The media was conceptualized as an interactive board game featuring two distinct family tree structures: the paternal family (父系家谱 [fùxìjiāpǔ]) and the maternal family (母系家谱 [mǔxìjiāpǔ]). This format was chosen because it visually represents family structures in a way that mirrors the hierarchical and generational nature of traditional Chinese genealogies.

During this stage, the researcher also designed the learning content, which included vocabulary related to family members, and composed narrative texts that introduce family members and kinship relations within Chinese culture. The JiaPu Puzzle game was equipped with narrative texts to help students understand the perspective of family relations in a Chinese cultural context. The narrative features a main character who explains their complete family lineage, covering both paternal and maternal sides.

The cultural components integrated into this content extend beyond just the family structure. They also include key aspects of Chinese tradition, such as the surname system (姓 [xìng]), and the culturally specific differences in kinship terminology between the father's and mother's sides an important and unique characteristic of Chinese kinship systems. The names of the characters in the narrative were designed in accordance with the traditional Chinese surname system (姓), in order to authentically reflect the cultural specificity of Chinese familial relations, including distinctions in terminology usage across lineage lines.

The next step involved creating a conceptual design framework to guide the development of the puzzle, by adapting the Chinese genealogical system (家谱 [jiāpǔ]) into a game format. As a formative evaluation during the design phase, the researcher conducted a self-assessment to examine whether the media design aligned with the findings from the needs analysis conducted earlier. Validation by subject matter and media experts was scheduled for the next stage, namely the development phase.

### 3. Development

In the development phase, the researcher created the instructional media based on the initial design: a puzzle board in the form of a family tree that represents kinship structures in Chinese culture. The media consisted of two separate boards one for the paternal side and one for the maternal side each printed on A3-sized acrylic boards. The researcher also developed narrative cards written in Mandarin to introduce family relationships contextually, and designed the game rules along with the interactive learning flow using the Canva application.

At this stage, the media developed during the design phase was subjected to expert validation to assess its feasibility for classroom use. Although consultation with a media expert was not conducted during the design phase, in the development phase the researcher held two rounds of revisions and consultations with a media expert on April 14, 2025, and April 17, 2025. As part of this process, the researcher administered a media validation questionnaire to the expert.

The validation by a media expert is essential in the development of instructional media. This aligns with Sugiyono (2023), who states that in order to ensure the quality and effectiveness of a developed product, expert validation is necessary. Therefore, expert validation was carried out on the JiaPu Puzzle media, focusing on three key aspects: media appearance, product quality, and ease of use. This is consistent with Arsyad (2011), who asserts that instructional media evaluation should include assessments of content quality, visual appearance, its usefulness in achieving learning objectives, and ease of use for both teachers and students. Hence, expert feedback is a critical step in ensuring that the developed media meets appropriate quality standards.

During the first meeting with the media expert, the researcher provided a validation questionnaire to assess the feasibility of specific components. The questionnaire included three assessment categories media appearance, product quality, ease of use. In the first aspect, which is the visual appearance of the media, Roby Yunia Irawan, S.Pd., M.Pd., as the media validator, assessed the media and gave it a score of 87.5. The validator stated that the media had an attractive cover design, rated as Agree (S). The statements regarding the color scheme and image quality received a Strongly Agree (SS) rating. However, the color

combination was rated as Agree (S) with a note suggesting improvements to the color elements of the game board particularly the maternal family side which should be adjusted to align more harmoniously with the other elements of the media. This aligns with Arsyad (2011), who argues that harmonious color composition can attract attention, create aesthetic impressions, and help distinguish information elements, thereby enhancing the student's learning experience.

Based on the media expert's validation, it can be concluded that in terms of visual appearance, the JiaPu Puzzle is considered feasible. This is consistent with Rayanto (2020), who stated that instructional media designed with appealing and proportional visual elements can improve the effectiveness of information delivery and increase learner engagement in the learning process.

In the second aspect, product quality, the JiaPu Puzzle was deemed highly appropriate by the media expert, receiving a perfect average score of 100. The first statement concerning the media size was rated as proportional, while the second statement on the durability of the materials used was rated Strongly Agree (SS). This is supported by Asyhar (2012), who emphasized that high-quality instructional media should be durable, easy to use, and suitable for the physical conditions of the learning environment. Proper size and sturdy materials enhance media longevity and user comfort, ultimately supporting more effective learning outcomes.

Regarding the third aspect, ease of use, the JiaPu Puzzle received a score of 75. This aspect included four evaluation items: ease of use, accuracy of image and text layout, clarity of usage instructions, and suitability of image sizes. All four statements were rated Agree (S). According to Reiser and Dempsey (2017), effective instructional media must take into account usability, including ease of operation by users without requiring advanced technical skills. They emphasize that overly complex media can become a barrier in the learning process.

During the second consultation with the media expert on April 17, 2025, the researcher submitted the fully revised, printed version of the media. In this meeting, the media expert confirmed that the final product was suitable for implementation with the target student group. This validation process marked the final stage of the media expert evaluation.

During the first meeting with the media expert, the researcher presented the JiaPu Puzzle media in its digital form (not yet printed). The materials shown included the puzzle board design, puzzle pieces, narrative cards, rule cards, and packaging. In this meeting, the media expert evaluated several aspects of the media, particularly focusing on the layout and readability of the narrative cards. Specific concerns were raised regarding the formatting of Hanzi and Pinyin texts, which were considered insufficiently organized, as well as the choice of font color, which hindered readability. As a result, further revisions were made to improve the text layout and adjust the font color on the narrative cards to ensure clarity and ease of comprehension for users. A comparison of the font conditions on the narrative cards before and after revision is presented in Figure 2.

Another revision discussed during the first meeting with the media expert concerned the use of color selection. As shown in Figure 3, the background color of the maternal side puzzle board before revision was not well-matched with the elements and ornaments, resulting in a pale impression that did not support its visual function effectively. Based on the discussion with the media expert, a revision was made: the original pink background color was changed

to a brighter red, which created a more visually harmonious appearance and enhanced the integration of the puzzle board with the other design elements.

The validation by the subject matter expert (SME) is also a crucial stage in the development of instructional media, as it ensures that the content presented aligns with learning objectives and is accessible to students. According to Sudjana (2021), learning materials should be designed contextually and relevantly to help students develop a deep understanding of concepts and achieve the intended learning outcomes. Therefore, content validation not only assesses the accuracy and appropriateness of the material but also evaluates clarity of presentation and relevance to students' learning needs.

Based on the validation results provided by subject matter expert Dhevy Olivia Firdaus, S.Pd., MTC SOL a lecturer in Mandarin language education on April 15, 2025, the JiaPu Puzzle interactive learning media received a perfect score of 100 across all four assessed aspects: content accuracy, usefulness, visual appearance, and language quality. This assessment was grounded in the evaluation of content relevance within the instructional media, in line with Sudjana (2021), who states that learning materials must align with learning objectives, be contextual, and support students in developing deep conceptual understanding.

The content accuracy aspect assessed four indicators: the material's alignment with Core and Basic Competencies, its relevance to Chinese kinship culture, and the suitability of the narrative text all of which received a perfect score of 100 with a Strongly Agree (SS) rating. Effective instructional materials must support learning objectives, as Mulyasa (2015) notes that the success of learning depends on the harmony between objectives, content, and instructional strategy. Yusup (2018) also highlights that content feasibility, or how well material reflects learning indicators, is central to media validity. Supporting this, Putra and Wahyuni (2020) found that when educational games align with learning goals, they significantly enhance student understanding—making content alignment a core criterion in evaluating instructional media.

The second aspect (media usefulness) also received a score of 100 from the expert. This aspect included two statements: the first regarding the puzzle game's appropriateness in helping students learn kinship material, and the second on the clarity of the questions presented in the JiaPu Puzzle. Both were rated Strongly Agree (SS). The language used in the media was clear and understandable, and the use of Hanzi characters was accurate and contextually appropriate. Furthermore, Wulandari (2019) notes that symbols and visual elements in instructional media must be designed contextually to avoid misinterpretation. This finding indicates that the media meets high-quality standards and effectively supports the learning of Chinese kinship systems.

Based on the expert validation, several suggestions and comments were provided as a foundation for improving the instructional content. The validation process played a crucial role in identifying weaknesses in terms of content, structure, and presentation. These inputs were used as the basis for revisions to enhance the quality and relevance of the material according to learning needs and established standards. Thus, the revisions made represent a direct follow-up to the validation process and contribute to optimizing the instructional media.

The expert recommended incorporating 10 comprehension questions at the end of the game to assess students' understanding of the material. These questions are directly related to the family structure described in the narrative text and are designed to be relevant to



the family relationships presented therein. They cover topics such as interpersonal relationships among characters, usage of kinship terms in Chinese culture, and students' comprehension of the surname system (姓 xìng). Accordingly, these question cards were added as an integral component of the JiaPu Puzzle. As shown in Figure 4, the cards were designed with visually appealing and well-organized layouts to facilitate comprehension and to reinforce the evaluative function of the media as a whole.

Following the revision of the question cards, the next improvement step focused on the character names in the narrative text, which became the starting point for a subsequent revision. Initially, the names were written only in Latin alphabet without the inclusion of Hanzi. Based on the subject matter expert's recommendation, the character names were revised to include both Hanzi and Pinyin for greater authenticity and alignment with Chinese cultural context.

Figure 5 shows that one of the character names in the narrative text was originally written only in Latin letters. In contrast, Figure 6 presents the revised version, which includes both the Hanzi and Pinyin of the character names, in accordance with the expert's suggestions.

#### 4. Development

During the implementation phase, a trial of the JiaPu Puzzle instructional media was conducted with students of Class XI IBB at SMA Laboratorium UM on April 24, 2025, over the course of two class periods (11:55 AM-1:50 PM). The class consisted of 22 students, who were divided into four groups, each comprising 5-6 students. The trial was divided into two game sessions.

In the first session, students were given 5 minutes to read the narrative text, followed by 10 minutes to play the game. Afterward, the class discussed the family structure presented in the narrative, which reflected traditional Chinese kinship systems. The second session was conducted with the same duration and structure. After the second gameplay session concluded, the researcher distributed a questionnaire to collect students' responses to the media.

During the implementation, students appeared enthusiastic and actively engaged. As a form of formative evaluation, the researcher reflected on the implementation process to assess the media's effectiveness in the classroom setting. This reflection involved identifying which components of the media worked optimally and which required improvement whether in terms of visual design, usability, or content delivery. The evaluation was informed by field notes taken during the trial, providing objective input for further refinement of the media before broader application.

The result of this phase is the student response to the instructional media used in class. These responses are presented in the table below.

**Table 1. Students' Responses**

No.	Assessment Aspect	Results			
		Strongly Agree	Agree	Less Agree	Disagree
1.	Jiapu Puzzle is very interesting.	17	5		
2.	The combination of design and material in Jiapu Puzzle is very suitable.	18	4		
3.	The text and images in Jiapu Puzzle are clear.	19	3		
4.	The text and images in Jiapu Puzzle are clear	9	12	1	
5.	The language used is easy to understand	16	6		

No.	Assessment Aspect	Results			
		Strongly Agree	Agree	Less Agree	Disagree
6.	Jiapu Puzzle is easy to use	16	6		
7.	The usage instructions of Jiapu Puzzle make it easier to use the media.	17	5		
8.	Using Jiapu Puzzle helps increase my enthusiasm for the material on the Chinese cultural kinship system	19	3		
9.	Using the family tree helps me learn about the Chinese cultural kinship system	19	3		
10.	The material in Jiapu Puzzle helps me learn the material being taught.	18	4		

The results of the questionnaire indicated that students gave positive responses toward the visual appearance of the instructional media, particularly in items 1-4, which addressed aspects such as media appearance, visual design, clarity of text and images, and layout of text and illustrations.

For the first item, 17 students (77.3%) agreed, and 5 students (22.7%) strongly agreed that the media had a good visual appearance. For the second item, 18 students (81.8%) strongly agreed, and 4 students (18.2%) agreed that the media design was visually appealing.

Regarding the clarity of text and images, the media received very positive feedback. A total of 19 students (86.4%) strongly agreed that the visual elements such as text, icons, and illustrations were clearly presented and easy to understand, while the remaining 3 students (13.6%) agreed. This means 100% of respondents acknowledged the media's clarity and how it supported content comprehension. The layout of images and text also received excellent evaluations. Again, 19 students (86.4%) strongly agreed and 3 students (13.6%) agreed that the layout was neat and easy to follow.

When asked whether the media was easy to use, a large majority expressed agreement. 16 students (72.7%) strongly agreed, and 6 students (27.3%) agreed that the media was user-friendly, with no technical difficulties or navigation issues. The absence of negative responses reinforces that the media was designed with user experience in mind, both in terms of interface and instructional flow. The usage guide provided within the media was also rated very positively. 17 students (77.3%) strongly agreed, and 5 students (22.7%) agreed that the instructions helped them easily understand how to use the media.

Most students also felt that the media increased their enthusiasm for learning about the kinship system in Chinese culture. 19 students (86.4%) strongly agreed, and 3 students (13.6%) agreed with this statement. Finally, the media was rated highly effective in helping students understand the learning material. 18 students (81.8%) strongly agreed, and 4 students (18.2%) agreed, with no student disagreeing. This effectiveness can be attributed to the combination of visual clarity, interactivity, and ease of navigation, all of which contribute to meaningful learning.

## Discussion

### Development

The JiaPu Puzzle instructional media was developed in response to challenges faced by SMA Laboratorium UM students in grasping Chinese kinship structures, particularly in distinguishing terms like 爷爷 (yéye) for paternal grandfather and 外公 (wàigōng) for maternal grandfather. This highlighted the need for supportive learning tools in Mandarin classes. The resulting media is an interactive board game featuring two family tree structures, accompanied by puzzle boards, narrative cards, and packaging all designed to promote comprehension through visually engaging and context-rich components that encourage intuitive learning.

Comprehending content through a board game aligns with the implementation of the gamification method. Gamification has been shown to enhance students' understanding of learning material through a practical, engaging approach that builds motivation and interest in completing learning tasks (Srimuliyani, 2023). This is supported by research by Azwah et al. (2025), which found that the application of problem-based gamification in Indonesian language classes led to increased student engagement and improved learning outcomes. Moreover, gamification also supports students' cognitive development through simulated learning experiences (Shaliha & Fakhzikril, 2022). In line with this, Agustina et al. (2024) concluded that the use of gamified media was effective in enhancing learning outcomes by improving students' ability to comprehend, apply, and analyze content in their study, particularly in Indonesian history.

The development of the JiaPu Puzzle employed a non-digital, conventional type of gamification. While often perceived as less advanced than digital media, conventional board games foster direct, hands-on engagement, which can generate positive learning experiences through real-time interaction (Mangundjaya et al., 2022). Using JiaPu Puzzle, students actively construct their understanding of the differences in kinship terms between the paternal and maternal sides by matching cards appropriately. This process encourages the active construction of knowledge through hands-on practice.

JiaPu Puzzle offers a more concrete and meaningful learning experience by incorporating multi-sensory engagement. Students are not merely reading or listening to material; they are also touching, assembling, and repeatedly observing vocabulary in a structured and physical format. As such, the JiaPu Puzzle provides a practical solution for helping students understand complex cultural-linguistic concepts such as the kinship term distinctions in Mandarin.

According to Yu et al. (2021), the use of game-based instructional media has proven effective in improving students' learning outcomes, motivation, engagement, and overall satisfaction. Their findings suggest that incorporating game elements creates a more engaging learning environment and encourages active participation. In the context of JiaPu Puzzle, this further supports the theoretical basis for using gamification particularly in non-digital forms to enhance understanding of complex topics such as the Chinese kinship system. The interactivity provided by gameplay encourages both cognitive and affective involvement, aligning with the principles of constructivist learning and intrinsic motivation in game-based education. Therefore, JiaPu Puzzle serves not only as an innovative and contextual instructional media, but also as a research-based strategy that is both effective and enjoyable.

### **Students' Responses**

The JiaPu Puzzle learning media successfully captured students' attention from the outset, with all respondents providing positive feedback regarding its design. In terms of

visual appearance such as the overall layout, clarity of text and images, and organization of visual elements most students expressed a favorable response. These findings align with the study by Sari and Nugraheni (2023), which asserts that engaging visual displays in digital learning media enhance students' understanding of material through a visual approach. In the second statement, 18 students strongly agreed and 5 agreed that the media design was appealing. Thus, the visual design of the media proved effective in stimulating student interest throughout the learning process. This supports the view of Rachman Hakim and Hidayani (2021), who argue that appropriate use of color, typography, and visual layout can enhance comprehension. With strong visual support, this media not only attracts attention but also facilitates a more effective and enjoyable learning process for students.

In terms of ease of use, the majority of students gave positive feedback. The media was designed with user-friendliness in mind, both in visual aspects and user flow. Consistent with the findings of Adam et al. (2015), ease of use is one of the key factors determining the effectiveness of media in achieving learning objectives. This finding reinforces the idea that the media is accessible to students of varying ability levels, thereby supporting both independent and collaborative learning. Additionally, Sari and Pramudibyanto (2020) emphasize that well-structured user instructions play a vital role in creating a positive user experience, especially in interactive media that involve exploratory learning.

Finally, students reported that the media helped them understand the material better, due to the combination of visual elements, interactivity, and intuitive navigation that supports meaningful learning. Research by Aisyah et al. (2021) suggests that effective instructional media provides not only cognitive learning experiences, but also affective and psychomotor ones, positively impacting student learning outcomes. The percentage of student agreement reflects the effectiveness of the media in delivering concepts clearly and engagingly.

## **Conclusion**

Based on validations by subject matter experts and media experts, as well as student questionnaire responses, the JiaPu Puzzle media was deemed highly appropriate for use in instructional settings related to Chinese kinship culture. From visual and design aspects to ease of use, students provided overwhelmingly positive feedback. The puzzle design effectively facilitated interaction, active engagement, and deeper comprehension through contextually relevant narratives and illustrations. The clarity of information, visually appealing structure, and easily understandable instructions made JiaPu Puzzle not only academically effective but also psychologically enjoyable for students.

Therefore, JiaPu Puzzle can serve as an innovative alternative in Mandarin language instruction, particularly in topics involving cultural aspects such as kinship systems. However, this study is limited by the absence of summative evaluation, as it did not include a comprehensive quantitative measurement of students' long-term learning gains. Accordingly, future research is recommended to integrate summative assessment and experimental methods with control groups to provide a more thorough evaluation of the media's impact on learning outcomes.

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