Designing A Game for Teaching Vietnamese as A Heritage Language for Children on the Foundation of Multi-sensory Education Theory

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Abstract: Multi-sensory educational methods are some appropriate ways to propose principles, processes, and directions when designing games used for teaching children Vietnamese as a heritage language. They make the teaching process more effective by enabling children to learn through multiple channels, therefore maximizing their capability. The authors focus on designing a framework for teaching Vietnamese as a heritage language to children and suggest a number of key principles including personalization, multi-sensory coordination, targeting, and flexible interaction. The game is designed with six steps: analyzing the psychological and cognitive characteristics of learners, determining the goals, choosing knowledge units, choosing the game format, preparing the tools, and organizing the game. This article also introduces some formats illustrating Vietnamese teaching games that combine two or more senses to enhance memory and interest in learning. Heritage language education is not only about teaching and learning a language, but also about preserving and developing national culture, expanding opportunities for Vietnamese language and culture.

Keywords: Games in teaching, Vietnamese as a heritage language, multi-sensory, Vietnamese children abroad.

Subject classification: Linguistics.

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1. Introduction

Resolution No.36-NQ/TW, dated 26 March 2004 on Overseas Vietnamese Affairs affirms that "Vietnamese expatriates are an inseparable part and a resource of the national community of Vietnam". One of the basic political tasks is to "actively invest in the program for teaching and learning the Vietnamese language among Vietnamese expatriates, especially for the younger generation" (Politburo of Vietnam, 2004). In recent years, the Vietnamese government has instigated programs supporting the Vietnamese community abroad in maintaining the Vietnamese language, as well as preserving and promoting Vietnam's national cultural identity. According to the State Committee for Overseas Vietnamese, there are currently about 5.3 million Vietnamese living and working in 130 countries and territories. Based on a clear awareness of the importance to maintain and promote the Vietnamese language and culture among the Vietnamese diaspora, supporting overseas Vietnamese children to learn Vietnamese as a heritage language becomes a pressing matter. As a heritage language, Vietnamese plays an important role in helping the young generation connect with their national roots and identity, cultivate pride in Vietnamese culture, and maintain a close relationship with their homeland.

Kelleher (2010) suggests that heritage language is used to "identify languages other than the dominant language (or languages) in a given social context. In the United States, English is the de facto dominant language (not an "official" language, but the primary language used in government, education, and public communication). Thus, any language other than English can be considered a "heritage language" for speakers of that language." (Kelleher, 2010: 1). When one generation migrates, members of the second generation and beyond will have to take on learning the heritage language. In families of Vietnamese children living abroad, the main way for children to learn Vietnamese is from their relatives, studying online, or with teachers at Vietnamese language centers. Heritage languages are considered a linguistic and cultural resource (Anh Tran, 2008).

Teaching Vietnamese to children through natural communication with relatives is the main choice. Some families where both the father and mother are

Vietnamese may also set rules for their children, e.g. at home they are only allowed to communicate using Vietnamese. Popular learning materials to support Vietnamese teaching are Vietnamese children's storybooks, learning and entertainment channels on You Tube, textbooks in the Vietnamese language at Vietnamese primary school, or Vietnamese language textbooks for foreigners, etc. Preserving the language for overseas Vietnamese children currently faces many difficulties. As Le & Trofimovich (2023) point out, there is a decline in children's performance in the Vietnamese language, especially among economic immigrants.

Children lack the motivation to maintain interest in learning over a long period of time because their new native language plays a key role in helping them integrate into school and the social environment.

Limited opportunity to interact in, and practice, Vietnamese means children may be less confident communicating in Vietnamese.

There is a lack of teaching materials, which have not been systematically compiled and adapted according to each subject. In some families, parents sometimes "force" their children to learn Vietnamese without considering their child's needs. Also, the way Vietnamese is taught sometimes lacks flexibility and appeal, making it difficult for children to learn and they become easily discouraged.

Results of Yeh, Ho & Chen (2014) show that the immigrant mothers who speak Vietnamese at home with their children increases their children's motivation to learn Vietnamese as a heritage language. Vietnamese expatriate pupils believe they have limited school support in their Vietnamese courses; those who live with their immigrant parents are more motivated to learn Vietnamese than those who do not. Pauline Phi Nguyên Đồng (2023) deems that it is necessary for students to learn about their heritage and culture in order to stay connected to their families and community, while heritage language programs can be sustained in schools and the Vietnamese communities. This is in line with Le & Trofimovich's (2023) conclusion that heritage language development and retention are subject to various contextual influences.

Faced with such a situation, teachers and parents are constantly trying to find and apply new methods of teaching Vietnamese to children, contributing to making the learning process of it as a foreign language more effective and attractive.

Among prominent educational measures, games are highly appreciated by many people because of their flexibility to combine education and entertainment. Based on the theory of multi-sensory education, this article researches the principles and processes of building games, and proposes a number of models in teaching heritage Vietnamese to personalize the learning experience, create a friendly communication environment, and stimulate interest with a natural desire to learn the language.

2. Games in learning and multisensory theory in language education

2.1. Games in learning a foreign language

Games in learning, also known as "teaching through games", "education-oriented games", is a method chosen to serve teaching activities associated with certain learning content. The Longman Dictionary of Language Teaching and Applied Linguistics defines a game as: "*An organized activity that usually has the following characteristics: a) a specific task or goal, b) a set of rules, c) competition between players, and d) communication between players in spoken or written language.*" (Richards et al., 1992). In playing activities, learners participate in an environment shaped by rules, also known as "game rules". They include: knowledge and skills that need to be mobilized; operations to be carried out; interactive activities or product presentations; and rules on evaluation, rewards, and penalties. A game can be divided into many different levels, players must exploit their own personal experiences to overcome challenges at those levels.

The multidimensional benefits of learning games are probably undisputed. In language teaching such benefits include: developing basic language skills (listening, speaking, reading, and writing) and other skills that often coexist in language learning (Lee, 1995); developing skills to interact with others such as how to politely complain or how to ask for help (Jacobs & Kline Liu, 1996); helping to retain interest in something that may seem boring (Thiagarajan & Parker, 1999); and providing a context for meaningful communication activities (Wright, et al., 2006). For each person, a game is an activity used to achieve a learning goal set by

the person. To win, players must have passion, actively seek knowledge, practice skills, accumulate experience, and develop their imagination and creativity. In the relationship between instructors (teachers, parents, relatives) and players (learners), games are a means of connecting and communicating in a friendly, natural way, to collaboratively solve problems and determine what the tasks are. Đặng Thị Kiều & Nguyễn Thị Ngọc Anh (2019) report that "Designing and applying language games has made the task of teaching and learning more interesting and attractive. Learners are more interested and activily in learning Vietnamese."

In the field of foreign language teaching, educators have designed many diverse types of games depending on the teaching goals, the content of language knowledge, or the language skills that need to be practiced. Each game has many variations to suit the cultural context, circumstances, level, interests, and specific needs of students. According to Hadfield (1996: 3-5) based on the main type of activities that learners need to carry out, games can be classified according to the following categories: sorting, ordering, arranging games; information gap games; guessing games, searching games; matching games; labeling games; exchanging games; board games; role-play games, and so on. This list is constantly being supplemented and updated by teachers to adapt to modern educational trends and the increasingly diverse needs of students.

In the field of heritage language education, recent studies also show that the use of games stimulates language learning motivation more strongly than traditional methods. Creating an exciting, interactive learning environment for heritage language learners is especially important because the learning process is long, requiring consistent practice. Little's (2018) research on the ability of technological games to develop heritage language skills (especially reading and writing) within a family unit shows that both children and parents consciously distinguish between the role of "learner" and "player", and collaborative family activities can help children overcome barriers to accessing technology and heritage languages. Alexander III (2018) researched the use of stress recognition games in teaching heritage Spanish. The game is designed in the form of arranging letters to form meaningful words. Test results show that most of the learners find the game to be interesting and they like the competitive, yet private, nature of the game. Besides stimulating interest in learning heritage languages, games are also used as a cultural educational tool in multilingual learning environments. Ariesta & Maftuh (2020)

propose measures to "cultivate" multicultural educational values for children in elementary school through traditional games, in the context of cultural and racial diversity, language, and religion in Indonesia. The authors emphasize that traditional games not only bring entertainment value but also contain cultural heritage values, with good meaning, and are useful in developing a child's community life.

In general, the application of games in the fields of language education, and particularly heritage language education, is suggested as an effective solution. The types of games are also very diverse and are still being developed to suit different teaching conditions and the learners themselves.

2.2. Multisensory theory in language education

Many scientists in the fields of psychology and clinical medicine have long affirmed that multi-sensory educational models improve learning efficiency compared to single-sensory teaching models. Shams & Seitz (2008) demonstrated that encoding, storage, and retrieval of cognitive information in the human brain is assumed to operate in a multisensory environment; single-sensory processing corresponds to an artificial processing mode that does not utilize the full potential of the cognitive apparatus, so efficiency is suboptimal. Based on this cognitive psychology, multi-sensory learning and teaching methods are becoming modern trends in education. The central argument of this theory is that teaching children is based on stimulating the five senses of sight, sound, smell and touch, as well as movement. The goal is to help learners retain knowledge for longer and actively practice their skills through diverse and interesting learning activities.

The multi-sensory teaching perspective is shared by many leading educators such as Treichler (1967), Montessori (2013), Judith & Suzanne (2018), and Robert C. Titzer (2007). They all found that the multi-sensory training model applied to many learning tasks was superior to traditional training programs. In fact, this teaching method has been integrated into the educational process at every level of teaching. Treichler (1967) state that people usually remember 10% of the content if they hear, 20% if they read, 30% if they see, and 50% if they see and hear. Montessori (2013) developed the Montessori method which inspired the multi-

sensory learning movement, combining visual, auditory, tactile, and kinesthetic approaches in most subjects. Judith & Suzanne (2018) established a method called "multisensory structural language education" in their work *Multisensory teaching of basic language skills*. This is considered a comprehensive manual on teaching methods based on visual, auditory, tactile, and kinesthetic connections. Some areas of application include helping students develop skills in the areas of phonological awareness, alphabet knowledge, handwriting, phonics, fluency, rhythm, comprehension, composition, and mathematics; and incorporating clear planning, structured multi-sensory language lessons that incorporate two or more senses. This approach aims to improve language skills and academic performance of struggling elementary to high school students.

Robert C. Titzer (2007), the father of the "multi-sensory" method in the field of early education, once again set a special milestone by applying this method to develop children's intelligence right from the early stages in his well-known five-volume series titled *Your baby can learn*. The premise of this method can be summarized as once a child shows interest in a particular topic, adults should encourage the child to learn that topic using as many senses as possible. Multi-sensory coordination helps nerve pathways increase connectivity and transmit information faster. Functions of the relevant areas of the brain work continuously to process information and children increase their ability to concentrate, recognize, and remember. This method also helps them feel as if they are playing and learning, instilling a sense of comfort and better integration with their surroundings.

The "multi-sensory" theory in early childhood education introduced by Robert C. Titzer has greatly influenced the views and teaching methods of many foreign language centers. Children learn foreign languages using the multi-sensory method. The senses are said to help with quicker and longer vocabulary retention, and with the ability to pronounce words more accurately using native intonation. Theoretical research and practice programs have affirmed the importance of multi-sensory education, opening doors for an effective and creative learning environment.

The "multi-sensory" educational perspective can be explained and clarified in relation to the "multiple intelligences" theory initiated by Howard Gardner (2011). According to the theory of multiple intelligences, each person has unique strengths and weaknesses, and everyone develops at different rates in each specific "intelligence area". These abilities can be identified and classified into distinct intelligence domains such as mathematical/logical, linguistic/verbal, visual/spatial, motor, musical/melodic, extroverted, introverted, and nature-oriented intelligence.

Gardner's view that play can connect multiple intelligences suggests the importance of using the senses in learning. Each child benefits from lessons designed in ways that stimulate different intelligences, prioritizing key senses, and working with other ones. For example, some children learn more effectively through visual methods while others learn more effectively through listening. "Multiple intelligence" and "multi-sensory" education emphasizes student-centered learning and customizes the learning process according to the individual learner's style.

3. Principles of designing games

3.1. Principle of personalization

One of the most important factors when designing a game to teach children the Vietnamese language is that the designer must grasp the characteristics of the players in terms of psychology, age, level, interests, life experiences, learning style preferences (e.g. drawing, singing, movement), forms of learning participation (e.g. individual learning, learning through games or discussion) or other special requests. The principle of personalization emphasizes that there needs to be a flexible approach in choosing the game, its content, the tools/equipment, the complexity of the rules, and the time and method of play to suit and maximize each person's potential. This is a way to stimulate motivation and tie lessons to life.

3.2. Principle of multi-sensory coordination

One method used in teaching Vietnamese as a heritage language is to design a "cluster of activities" that mobilizes the synergy and interaction of the senses,

promoting optimal brain power. A specific example is when introducing a new word like *tủ lạnh* ("refrigerator)". The teacher will point to the word, read it out loud, the learner will listen, repeat the sound, and write down the word. In this series of activities, children use a combination of visual (seeing letters), auditory (listening and speaking), and motor (writing) skills to remember. Another series of activities shows the combination of vision (looking at letters) and touch (creating/writing letters), such as creating words by cutting and pasting, writing on different materials (e.g. sand, paper, wall, boards), and so forth.

Interesting Vietnamese teaching activities connect at least two senses, or even three or four. Learning games that exploit visual impressions often use pictures to help children associate words with specific images such as join the dots in alphabetical order to complete a picture and then color it in; jigsaws and word puzzles (e.g. match pictures with their corresponding words); find the words that best describe a picture; word quizzes based on pictures (e.g. look at a picture and answer questions about its content or words related to the picture); using pictures to tell a story, and so on.

In these games, children will transfer recognized words from images (visual) to spoken or written words (auditory or hand kinesthetic). Games that exploit auditory impressions mainly focus on learners' listening experiences. Next, children recreate the results of listening by using other senses to formulate something such as role-playing based on a given scenario or composing their own situations such as interviews, sales negotiation; exams to pronounce and rewrite words correctly; listening tests and correct repetition; listening tests and filling in the correct words; listen and re-present the content of the listening lesson; listen and rewrite the content of the lesson; listen to a text being read and take part in a question and answer session about the lesson content. Among the integrated senses, there will be one sense that stands out making a stronger impression, relevant to the particular child's interests. The remaining senses play the role of consolidating information, connecting pathways in the brain, and helping children retain knowledge and develop long-term skills.

3.3. Principle of goal direction

The goal-oriented nature of a game is shown in determining its objective. The essence is that the game should be a "fun" exercise carried out in an engaging,

interactive setting. Each game is not only a means of entertainment but also an effective learning tool, helping students integrate and develop their Vietnamese language skills. Therefore, game designers and organizers need to answer the question: after playing the game, what language skills will learners practice and develop, and what units of Vietnamese knowledge will they consolidate? This goal needs to be clearly defined: learning aspects of Vietnamese (e.g. phonetics, vocabulary, grammar) or learning skills (e.g. listening, speaking, reading, and writing), or a combination of both. The goal of the game also needs to be consistent with the learning content and the chosen game format. For learners, goals help them realize the purpose of learning and increase their motivation to overcome challenges while playing. For teachers, the goal is the basis for evaluating how effective the learning process has been throughout for the individual.

3.4. Principles of flexible interaction

Depending on the learning context in a family, a study group, or a Vietnamese class, the games used need to provide flexible interaction. Interactive dimensions include those between learners (children) and instructors (teachers, volunteers, parents, etc.); interaction between children studying in the same group and class; or interaction between learners and learning materials. With paper-based games, varied form and content helps to create a learning environment that stimulates curiosity and motivates learners' active participation. Interaction between players is expressed through discussion, competition, or cooperation in specific situations to help them learn from one another and achieve common goals together. In particular, teachers acting as game organizers need to give timely feedback to learners after playing, helping them recognize what they did well and what needs improvement, thereby moving towards effective development.

4. Process of designing and organizing

Our proposed process of designing and organizing games in teaching Vietnamese as a heritage language for Vietnamese children abroad is based on the following six steps:

Figure 1: Process of Designing and Organizing Vietnamese Teaching Games
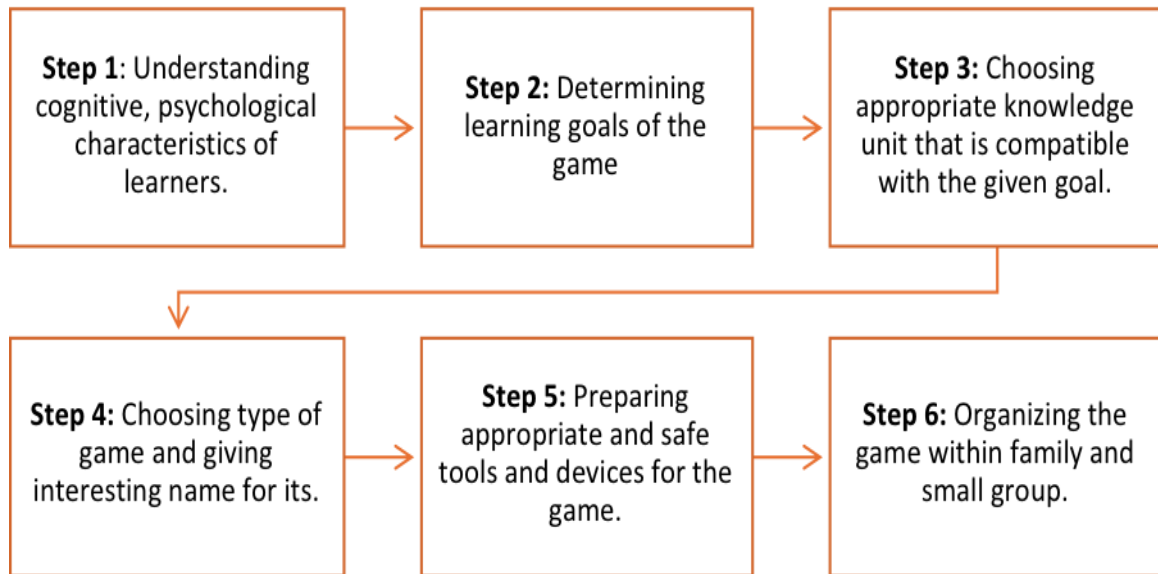
In steps 1 and 2, designers need to be aware of the cognitive and psychological characteristics of learners to ensure that the selected games promote and focus on the sensory benefits preferred by learners. For learners who like visual experiences, designers need to prioritize games that use diagrams, pictures, tools, posters, etc. For learners who prefer auditory experiences, games that use speaking activities, music, songs, stories, etc., should be prioritized. For learners who like tactile experiences, the focus should be on games that require physical movement such as jumping, dancing, creating shapes, etc. When understanding what a player needs, the designer will begin by determining the student's learning goals. The game is also the means of developing knowledge or language skills.

In step 3, the designer should pay attention to choosing units of language knowledge that are appropriate to the learner's characteristics and the goals identified in steps 1 and 2. These can be phonetics, vocabulary, grammar, or communication skills such as listening, speaking, reading, and writing. The selected unit of language knowledge must be suitable for the learner and at the same time stimulate curiosity and a desire to explore.

In step 4, the designer needs to identify the "sensory cluster" activated during the play activity and determine which senses play the main role. Table 1 shows suggested "multi-sensory" activities suitable for specific player characteristics.

Table 1: The Actions of Multi-sensory Activities

No.	Object	Sensory coordination	Suggest corresponding multi-sensory activities
1	Learners enjoy visual activities	Observe and speak	Watch and talk about pictures, movies, etc.; read and underline the key words in a book; find hidden words in the picture; read flashcards and corresponding words; arrange given letters into words; observe the pronunciation in the mirror and repeat; draw a diagram showing the types of information learned; create vocabulary mazes, complete crosswords, create concept maps; find connections between knowledge, personal experiences, and visual imagination.
2	Learners enjoy auditory activities	Listen and speak	Listen to songs and sing; music and singing; listen to lectures and follow along; listen and retell stories; read aloud; expressive reading; discuss and debate in groups; Q&A sessions in groups.
3	Learners enjoy tactile activities	Touch and talk; touch and write	Touch tangible objects, verbalize and write corresponding words and sentences; hands-on activities (e.g. cooking, writing the alphabet, etc.) and introduce the process; write letters on different materials (e.g. sand, sandpaper, walls, boards).
4	Learners like physical activities	Movement and communication (listening, speaking, reading, writing)	Perform some mechanical operations; use movement to explain word meanings, or express your own way of thinking; use actions, gestures, and movement to express a certain event; drama: write a short play and assign roles; participate in field trips, picnics, and experiments; learn through vocational training.

Next, each game needs an interesting and appealing name which sparks children's immediate interest. The name of the game is not only a characteristic brand but also reflects the content or form of the game, consistent with children's expectations and experiences. This is important because children are often attracted to what sounds fun and interesting. For example, a pronunciation training activity may have an attractive name such as "Magical Rhymes"; a game that focuses on listening skills and distinguishing initial sounds could be a fun quiz called: "Sound Quiz"; the activity of creating words from individual letters of the alphabet could be named: "Quickly typesetting". Such names not only make the game livelier but also stimulate children's imagination and creativity, making them want to take part.

In step 5, preparing the method and equipment for the game, such as boards, pens, magnetic cards, pictures, computers, tablets, etc., must match the requirements of the game, ensuring safety and ease of use. Adequate preparation helps the game take place comfortably, happily, and effectively.
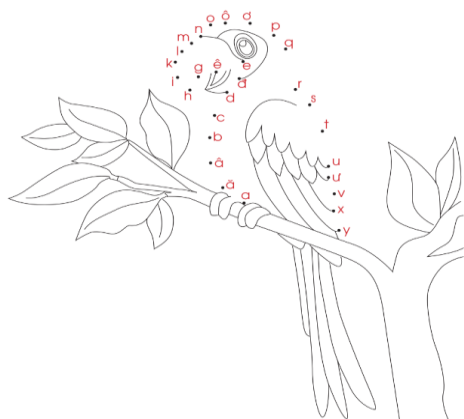
In step 6, when organizing teaching games in different domains (e.g. family, study groups, Vietnamese class), the game organizer will announce the rules of the game, clearly explain the content, and specific activities (if necessary, the organizer may give examples for learners to observe), and the rewards and penalties during play. While children play, the organizer can provide support and suggestions to a certain extent. At the end, children will receive an evaluation and reward from the organizer.

5. Some game formats

5.1. Connect the dots and coloring in

The use of sight is the main sense in this game, shown through the requirement to connect the dots in alphabetical order, and coloring in the completed picture. This also requires skillful hand coordination. Players can also read out the name of the sound represented by the letter and connect the dots to remember the name of the sound associated with each letter.

Picture 1: Game Connect the Dots-color	*Exercise goal: Recite the alphabet.*
	Elementary level
	Exercise requirements: Please connect the dots on the picture in alphabetical order a, ă, â...
	to complete the picture. Color in the picture as you like.
	How to do it: the game designer uses a hollow shape (e.g. an animal, or object) according to the learner's preferences. Players are required to connect the dots one by one in alphabetical order to complete picture. Players must remember to connect the dots in alphabetical order. They then color in the picture according to personal preferences.

5.2. Exercise game

Picture 2: Exercise Game

Letter C   *Letter H*   *Letter S*

Exercise objective: Recognize Vietnamese alphabet and read the sound names correctly.

Elementary level

Exercise requirements: Shape the letters using your body.

How to do it: The teacher will read the names of the sounds represented by the letters, the children choose a letter by lottery, the teacher guides them in how to shape and model the letters with their bodies and they can collaborate with their classmates. Players can use a mirror to observe their actions and adjust their posture to resemble the letter they selected. Once formed, they will read the name of the sound that letter represents, the teacher and classmates can make suggestions to help with correct pronunciation.

This game stimulates motor skills and coordination of the senses including vision (e.g. observing how the teacher shapes the letters, looking in the mirror to adjust one's own body shape), touch (e.g. feel and control one's body to form a shape), hearing (listening to the teacher's instructions, pronunciation and receiving feedback from others).

5.3. Replacing pictures with words

Picture 3: Replace Picture by Words

a) 🌳 nhà, lá vườn
b) cưỡi ngựa xem 🌸
c) mượn gió bẻ
d) càng già càng cay
e) Ăn nhớ kẻ trồng cây.
g) Tránh vỏ dưa, gặp vỏ
h) Vỏ dày có móng tay nhọn

Exercise goal: Expand the vocabulary of idioms and proverbs

Intermediate level

Exercise requirements: In the following idioms and proverbs, each word corresponds to an image. Please write the idiom or proverb represented here
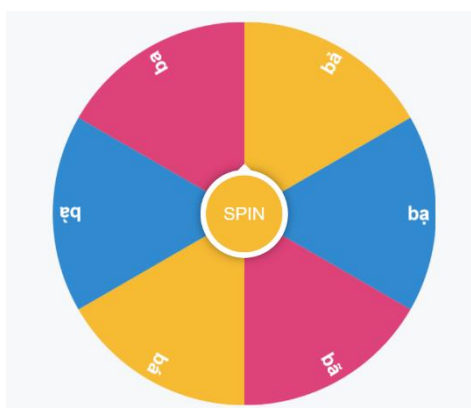
How to do it: Children use their sight to identify the images and associate them with appropriate words to form idioms or proverbs. This is an interesting way to expand one's understanding of Vietnamese idioms. Afterwards, children listen to the teacher explain the meaning of the idioms before they write the words down.

This game combines visual, auditory, and kinesthetic handwriting. Also with this game, the designer can adapt the format such as reading a story with images that need replacing with words; decoding images in a letter, and so on.

5.4. Magic wheel game

Learners need to listen to the instructor articulate the word in order to learn the correct pronunciation; they use the sense of sight to look and write the words down on a separate piece of paper or board and then compare the results with the instructor; and they use fine motor skills to write down the words they hear being pronounced. This multi-sensory combination helps them strengthen their pronunciation skills more accurately.

Picture 4: Magic Wheel Game	*Objective: Practice correct pronunciation*
	Elementary level
	Requirements: Spin the 'wheel' divided into segments bearing words, learners listen, repeat and write down the word they hear.
	How to do it: The instructor prepares a foam or cardboard circle with an axis in the middle, divided into six segments each bearing a word. A cardboard arrow is attached to the axis. After spinning the wheel, the arrow will stop on a segment, the instructor will pronounce the word on the segment. The instructor and learners write the word down. When finished, two people hold up what they have written and compare the results. If the words match then the learner wins.

5.5. Supermarket game

Children use their listening skills to hear phrases and actions spoken by the leader, and mimic phrases and movements. They use sight to observe the leader's movements which they copy according to the verbal instructions given.

Picture 5: Supermarket Game	*Exercise goal: Create fun rhyming phrases*
	Elementary level How to do it: The game leader will shout out a phrase and perform a corresponding action, such as "B goes to the market: buying instant noodles - hugging while walking" and perform the movement while walking and hugging. Players must shout out and do the same movements. Then they take it in turns to be the game leader. They say the names of items and related action words, as long as the words rhyme and are fun, e.g. buy some pork - climb while walking, buy an ivory comb - ironing clothes while walking, buying shirts - reading the newspaper while walking, buying pants - making rhymes while walking, and so on.

5.6. Calling the boat

Picture 6: Calling the Boat	*Objective: Pronounce and write down the words correctly*

Thuyền "Ngọc" chở "ngô"

Thuyền "Na" chở "nấm" | *Level: Beginner or intermediate*

How to do it: Each player needs to find items that start with the first letter of their name. Anyone who says the wrong letter or says the same thing as someone else's items will miss a turn. The leader (e.g, Phong) begins with an example sentence: "Phong's boat carries pigs. What does (player name)'s boat carry? The player whose name has just been called must immediately respond according to the above form. This game is suitable for large groups. If the number of players is small, e.g. within a family unit the game leader can change the example sentence to e.g.: "Boat (grandfather, grandmother, father, mother, brother, sister,) + player name + what does it carry?" and the players answer accordingly. |

This game combines mainly two senses: hearing and sight, along with the use of memory and quick thinking. Players must focus on listening to what the game leader says. Listening and processing audio information is the main factor, and at the same time, players need to quickly identify the first letter of the item they are looking for and respond quickly.

5.7. Some simulations and role-play games

The content of Vietnamese lessons can also be put into interesting hypothetical situations such as: "a baby frog looking for its mother", "a squirrel flying a kite", "fishing", "a fish looking for its school", "bees looking for honey", "a mountain train", "taking a taxi", "a water adventure", "picking apples", "fruit picking", and so on. The players act out the role of the character in a given situation, participating in finding solutions, and overcoming obstacles. Each challenge in the series is in the form of a question, an exercise, or a learning task that needs solving. These situations are illustrated with charming, colourful images, that attract and encourage children to take part. Children practice their communication skills (listening, speaking, reading, and writing), while also developing their understanding of the world and connection to nature, as well as expanding their imagination. Below are some sample simulations that integrate games with expanding vocabulary and correct spelling.
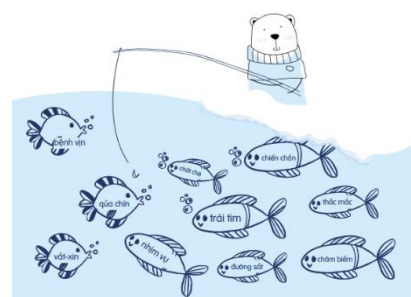
Picture 7: Some Samples of Games
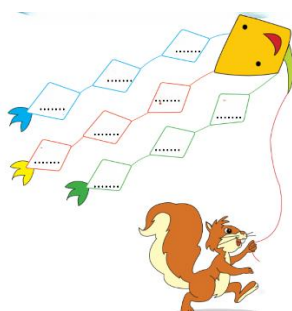
| A baby frog looking for its mother | A squirrel flying a kite | A bear fishing |

6. Conclusion

Recognizing the important role the Vietnamese community abroad plays in preserving and promoting their national culture and language, this article offers a solution for teaching children Vietnamese as a heritage language. The result shows that the method of using learning games on a multi-sensory educational platform gains significant achievements. When a "cluster" of children's senses are stimulated at the same time, their ability to remember, understand, and participate in learning activities is also enhanced. To design a game for teaching Vietnamese as a heritage language, designers need to establish the main principles including personalizing the game according to the learner, multi-sensory coordination in each game, and focusing effectively on the goals and facilitates for flexible interaction during play. The game design process has six steps: (i) determining the cognitive and psychological characteristics of learners for choosing goals; (ii) units of knowledge; (iii) format of the game; (iv) what the game is called; (v) preparing the media/equipment; and (vi) adapting the game according to different environments. Within the framework of this article, the authors have introduced six formats that combine two or more senses, applicable to beginner or intermediate levels of Vietnamese learning, embodying a diverse range of play activities (e.g. an individual with learning materials; an individual with relatives/instructors; an individual studying with friends).

In the current context of globalization, heritage language education is not only about teaching and learning a language, but also about preserving and developing national culture. Due to the targeted scope of this article, certain aspects are not mentioned such as the integration of Vietnamese cultural and historical elements into the content of the games; and the use of Vietnamese learning applications that integrate interactive games with technology platforms. However, with strong technological development and widely available internet, using multimedia in heritage language education has become more convenient than ever. Integrating technology into multi-sensory educational game design in order to expand opportunities for experiencing Vietnamese language and culture could be a topic for further research.

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