Applying the principles of Matteo Ricci's memory palace technique

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Abstract - Vocabulary mastery is a crucial factor in language learning and it can be problematic for bilingual young learners of the preoperational stage. Matteo Ricci, a Jesuit missionary to China, was able to teach Chinese by using and developing an ancient mnemonic method called the memory palace technique, which then became a widely recognized language learning technique. The current researchers sought to discover whether or not the principles of Matteo Ricci's memory palace technique were still relevant to today's language learning context and applicable in designing English vocabulary learning media. The present research focused on the detailed aspects of the technique and to the guiding principles of educational media to learn English vocabulary items. The current research produced a prototype for a set of vocabulary learning media that could later be implemented, tested, evaluated and developed by other instructors and future researchers interested in the subject.

Keywords: memory palace, vocabulary, learning media, bilingual

1. Introduction

The study on memory and how it works has been captivating experts and academics alike since the time of ancient Greek. Lagazzi (2013) in his writing on Matteo Ricci's Memory Method, has noted some of the famous pieces written for the subject. Yates (1999) elucidates how mnemonic techniques have been applied throughout generations to enable "accurate recollection of information when external sources of reference were unavailable". Seeing how advanced human civilizations have developed into, it can be fathomed how the works on memory can actually improve learning. Among the various enduring mnemonic strategies, one of the longstanding yet most helpful is the Method of Loci (MOL); also known as the memory palace technique (Spence, 1985). One of the key figures in developing the memory palace technique to enhance language learning was Father Matteo Ricci, SJ (1552-1610).

Vocabulary acquisition is of high importance when it comes to language learning, without sufficient vocabulary bank, proper communication cannot be conducted fluently (Marzban & Firoozjahantigh, 2018; see also Sumarni, 2016). Richards and Renandya (2002) argue that vocabulary is an "indispensable aspect" of any extended communication and is considered even to be a vital element of language learning than structure. In its acquisition, the mnemonic method has been used to help to learn and memorize vocabulary items (Siriganjanavong, 2013). Pillai (2017, as cited in Marzban & Firoozjahantigh, 2018; see also Wahyuningtyas & Wulandari, 2017), defines mnemonic methods as "techniques of devices, such as a rhyme or an image, that serve to enhance the storage and the recall of information contained in memory and they can be either verbal or visual in nature" (p. 62).

Matteo Ricci's memory palace technique employed the strength of the ever-developing mnemonic methods in vocabulary acquisition. Therefore, it is relevant to be applied as a guiding principle in English learning material building. A study conducted by Sydow (2015) has confirmed our belief that students between the age of 3 and 6 are at their prime stage in vocabulary learning. With the combination of utilizing colorful visuospatial items imbued in the vocabulary learning media and the orderly-managed principle of the memory palace technique, we believe that vocabulary learning, especially for young learners in that age group can be enhanced. Based on that standpoint, this study was conducted to discover the possible application of Matteo Ricci's memory palace technique principles in designing vocabulary learning media, especially for bilingual young learners of the pre-operational development stage (McKay, 2005).

A similar study on the topic had been conducted by Lagazzi (2013) focused more on the construction of the design of lessons that concentrated on the enactment of such methods in the context of English phrasal verb acquisition for students of secondary school. This current study provides a preliminary review of the possible application of the technique's principles when being applied in designing English language vocabulary learning media. In the introduction section, the present researchers provided the rationale, the significance and the inferred benefits of the research. The research question is: How can the principles of Matteo Ricci's memory palace technique be applied in designing vocabulary learning media?

In the previous study section, the researchers provided reviews on the theories of a memory palace, theories of vocabulary acquisition in language learning, cognitive development, multiple intelligences, and language-learning material design. In the

method section, the researchers describe the process of how the researchers acted as the main instruments and analysts of the research, making use of Borg and Gall's Research and Development model as the methodology in designing a preliminary; pre-trial material model based on the principles of Matteo Ricci's memory palace technique imbued in English vocabulary learning context. In the Findings and Discussion section, the researchers give the details to the research's outcome and, last but not least, conclusions of the research in the Conclusion section. Some suggestions for further research are also included at the end of the section.

To answer the research questions, the researchers provide some reviews of the literature previously done by other experts. The subjects that are being covered are as follows: 1. method of loci and the memory palace of Matteo Ricci, 2. review on bilingualism, 3. Review on vocabulary learning and Piaget's cognitive stages of childhood development, 4. review on Gardner's multiple intelligences – visual-spatial and linguistic intelligences, and 5. review on materials development and aids making for English language teaching.

Method   of   loci   and   the   memory   palace   of   Matteo   Ricci The term loci is Latin for location (Yates, 1999). Historically, Cicero's (1969) De Oratore tells a story of a man named Simonides of Ceos. Simonides of Ceos invented and developed the method to its today's form, but the usage of the method remained mainly within the dialectical and rhetorical context, in which it was taught for centuries. Referring to Thomas Aquinas' treatise, during the Renaissance in Europe, Christian monks started to focus on this method because of their devotion and willingness to understand the Bible. After deepening the understanding and memorization of the holy text itself, the monks would meditate and interpret the sacred book by reviving all the passages in their minds. Through religious practices, they developed the Method of Loci, along with many other mnemonic methods, into becoming the Art of Memory. Among the supporters of this method and its development as art were Saint Thomas Aquinas himself, and Father Matteo Ricci. Aquinas, White, and Macierowski describe it as a means for "finding and strengthening a person's virtue" (2005: 93).

Matteo Ricci's description of the Method of Loci, as cited by Lagazzi (2013) is "a basic architectural mnemonic method that, in order to memorize things, suggests connecting images with their locations." Based on this principle, Ricci would later develop the memory palace technique. The memory palace technique dictates that the user must set up a certain imaginary location, for example, a small building, a house, or even a palace. The user must then put certain images in the building's rooms, connecting those certain images with its precise location, together with the details. This technique stated a certain building or enclosed location because of the imagining capability of the human brain, in which it can picture a journey on a route to explore various rooms in a real and well-remembered place or a place familiar enough that meticulous aspects of that imaginary location can be memorized. To properly utilize this technique, the user must first set up the connections between certain images and their exact point of location.

The multiple locations are known as the 'rooms' of the palace (or location). The user must be familiar enough with the chosen 'palace', its 'rooms' and the details of it. The images in the 'rooms' would then stay in rest until the user "comes" to them and "meets" them in the room while interacting with them one by one in an orderly manner; by "walking through" the rooms (Sabbatini, Xu, & Ricci, 2010). The images chosen according to Ricci himself, as mentioned by Spence (1985: 52-61), should be 1) vivid,

2) detailed, 3) colourful, and most importantly meaningful. The human brains are capable to picture any objects even in a three-dimensional shape, which gives the learners the opportunity to manipulate the mental image and give certain details in our effort of making them memorable enough so that they are easy to be recalled. To add to the fun, a piece of extra information on the object's sound and action, along with their unique looks, can be added so that a complete set of pictures imbued with information can properly be stored in the "palace's" "rooms".

Meisel (2004) describes bilingual children as children growing up with two or more languages from birth or soon afterward. In accordance with Meisel (2004), Lightbown and Spada (1999) on early childhood bilingualism opine that the majority of children in the world are exposed to more than one language in early childhood. This process starts even as early as the moment they are born and are able to listen to the languages of the people around them. Children who hear more than one language virtually from birth are sometimes referred to as 'simultaneous bilinguals' (Lightbown & Spada, 1999: 3). According to them, children do have the ability to learn more than one language in their earliest years. This is due to the fact that when simultaneous bilinguals are in contact with both languages in a variety of settings. As they have been exposed to multiple languages, whether on purpose or not, there is a reason to expect that they will progress in their development of both languages. Indonesian children who are raised by Indonesian parents using English in their daily conversation will develop both their Indonesian and English. There is a great possibility that they will mix up the vocabulary items they have learned from both languages. Köppe (1996), on the other hand, categorizes bilingualism as a topic closely related to early code-switching.

The progress on bilingualism may give a challenging impact on young learners. In some cases, children seem to continue to be caught between two languages: not having mastered the second language, they have not continued to develop the first. Meisel (2004) explains that when children are exposed to more than one language during early developmental phases, they might be "confused linguistically, cognitively, emotionally, and possibly even morally". Based on this preconception it is logical to assume that parents and teachers alike might distrust the practicality of bilingual education itself. Grosjean (1982) sees monolingualism as opposed to bilingualism as the effect of an "impoverished environment" where the occasion in which language can be practiced is not completely developed.

Bilingualism, as knotty as it is, is still preferable rather than monolingualism. He further reasons that bilinguals rarely use the languages that they have learned evenly, and regularly in each territory of their social environment. They use the language for "different purposes, in different contexts, and in communicating with different partners". Thus, their aptitude and capacity in using each of the languages learned to reveal their fondness and necessity in the "multifaceted social contexts" in which they intermingle with their peers. Vocabulary learning and Piaget's cognitive stages of childhood development.

Wood, Smith, and Grossniklaus (2001) provide a review on Jean Piaget's (1896-1980) four cognitive stages of childhood development, namely:
1. Sensorimotor Stage: from birth through 2 years old. During this developmental stage, children learn about their surroundings by using their senses and the manipulation of objects.
2. Preoperational Stage: ages 2 through 7. During this stage, young learners start to develop memory and imagination. They are also capable of comprehending substances

symbolically, and of comprehending the concepts of past and future. 3. Concrete Operational Stage: age 7 through 11. During this stage, children become more aware of external events, as well as feelings other than their own. They become less egocentric and begin to understand that not everyone shares their thoughts, beliefs, or feelings.

4. Formal Operational Stage: Ages 11 and older (adolescence to adulthood). During this stage, children are able to use logic to solve problems, view the world around them, and plan for the future.

The description has given the researcher an insight into the supposed target learners of the design. In the context of Yogyakarta, Indonesia, the age-range of the preoperational stage covers young learners from Kindergarten A grade, up to the second grade of Elementary School. This is the period which the current researchers deem to be the right moment to enrich the vocabulary bank of the young learners within that group by using the learning media designed based on the principles of Matteo Ricci's memory palace technique.

During their early stage of development in language learning, a gradual decline sets in before the age of five (that is exactly after the preoperational stage); the critical period then ends during an age span ranging approximately from age seven through ten. In this critical period, vocabulary learning should be enhanced and optimized. A good follow up on the previous learning step must be conducted. This is where memory takes place. Good storage must be built into the young learners' long-term memory bank. Meisel (2004) elaborates: pieces that were stored in long-term memory will linger, while those which are not "impressive enough" will be shed off and left behind (Meisel, 2004: 13). This can trigger a further study on the "shed-off" subject to become problematic.

That is why it must be made sure that the children during this period receive the proper approach, method, and technique, especially in English vocabulary learning so as to make their English learning interesting and impressive. This way, the vocabulary items they have learned previously during the preoperational stage can be well maintained and stored in their long-term memory.

Verbal-linguistic and visual-spatial aspects of Howard Gardner's multiple intelligences. Humans can be good at all of the multiple intelligences if they start from an early age (e.g. Gardner, 2006; Brown, & Jernigan, 2012; & Dobbing & Sands, 1973). Actually, there are tendencies in the possibility of young learners possessing multiple intelligences. It is significant for researchers and educators to recognize and sharpen the appropriate method of developing young learners' intelligence. The researchers adjust and adapt the memory palace technique to design a prototype aid that aims to increase young learners' verbal-linguistic intelligence in relation to their continual effort in mastering English vocabulary.

The added story-telling technique via visually-imbued learning media provides the learners with aid to support their imagination on the "palace", its "rooms", and its characters together with its details. It solves teaching problems regarding a particular set of vocabulary items related to location, size, shapes, and colours. The aid is made with the aim to help their abstract memorization thinking. The use of visual material helps the teacher to introduce the vocabulary in English. For example, when the theme is about animals and growth, teachers can immediately use the aid to show the concept idea of the animals' body parts, their colours, and their resting place (the "location"). Visual teaching media enhance vocabulary learning. Therefore, young learners will

easily learn the vocabulary items permeated with pictures and details as guided by the principles of Matteo Ricci's memory palace.

2. Method

This study used secondary data in the form of a children's story to be used as the mainframe of the material design. The story taken as the sample material for the research is the infamous Chinese children story entitled: Little tadpoles looking for their mom (小蝌蚪找妈妈). The story presents the adventure of a group of new-born tadpoles looking for their mother; the frog. In the journey, they are meeting Mrs. Duck and her four ducklings, Mrs. Fish and her triplet fries, Mrs. Crab and her twin baby crabs, Mrs. Turtle and her hatchling son, and finally Mrs. Frog; their mother. The researchers believe that this story is suitable to be used as a model material for an application. The story has its morally good East-Asian values, such as to never give up, to think critically, and to respect elder people.

Several varieties of the fable were also available, and the current researchers had chosen the one adapted by Lu Bing, published online in 2013. Some adjustments on the content of the story, namely the dialogues and the diction being used were made and modified to suit the local context of young learners who live in Yogyakarta, Indonesia. The intended students were not yet being involved as this research is an Iterative Design or Prototyping; the preliminary step of possible future research. The current research focused on drawing the essential guiding principles of Matteo Ricci's memory palace technique to the material model (Wray & Bloomer, 2006). The final product of this research would be a sample set of vocabulary learning media, built based on the principles.

The concept or the actual form of the suggested material can later be used in teaching and learning activities, being evaluated, and further developed. The model followed the guidelines in pictorial-material making suggested by Yunus (1983). The Research and Development method in designing the model materials was conducted in several steps: the first step was drafting in which the researchers studied several discourses on the history of Matteo Ricci, Matteo Ricci's Memory Palace technique, theories on child cognitive development, multiple intelligences, bilingualism, material designs, the model proposed by Borg and Gall (1983) and the guidelines provided by Tomlinson (1998).

Second, the current researchers chose one of the versions of the story to be modified and developed into the materials intended to be made. Third, the researchers designed and made the materials based on the studies. The study was a qualitative one in which the researchers also included the instructions on how to use the materials as well as the rationale behind it. It should also be noted that the researchers were the main instruments of the research. The researchers' personal experience and the literature reviews were used as the triangulation on the data.

The data were analyzed and the current researchers identified the vocabulary items that would include the main characters of the fables and the researchers drew pictures of the characters on the paper one "room", each with distinguishable colour, and their distinct surrounding environments. The concept images could be developed into a flat shadow-puppet like a puppet with distinct colours, and dimensions. The details of the main character puppets were made based on the major principles of

Matteo Ricci's Memory Palace (Hsia, 2010; Standaert, 2010; & Legge, Madan, Ng, & Caplan, 2012). Later the dialogues and the gimmicks of the puppets were practiced by the researchers to fit with the plot and the duration of the story.

3. Results and Discussion

The results of the vocabulary learning media based on the memory palace are as follows: The title of the story is The pond. The pond where the tadpoles and the other animals live serves as the "palace", which is also the setting provided by the teacher for the students. The pond has five rooms and one entrance. The entrance of the pond lies in the middle-bottom side of the picture. It is depictured as a bunch of river kelp, serving as the "home" of the tadpoles.

This is the starting point in which the young learners may start imagining themselves as the tadpoles. The pond is to be explored from left to right (clockwise). The five "rooms" of the pond can be described as follows:

(1). Room one; Mrs. Duck's nest. In this room, the tadpoles met Mrs. Duck with her four ducklings. She is in the middle of feeding her hungry ducklings when the tadpoles visit her place. The colours appear in this room are Beige for Mrs. Duck's nest, bright white for Mrs. Duck's feathers, and bright yellow for the ducklings.

(2). Room two; Mrs. Fish's cave. In this room, the tadpoles meet Mrs. Fish and her triplet fries, playing hide and seek in their comfortable riverbed cave. The colours appear in this room are Purple for Mrs. Fish, pink for her fries, and bright red for the cave.

(3). Room three; Mrs. Crab's root home. In this room, the tadpoles are to meet Mrs. Crab and her twin baby crabs. They are depictured practicing for the pond's annual musical performance. The colours appear in this room were: Red and white for Mrs. Crab, orange and white for baby crabs, and brown for the tree stump.

(4). Room four; Mrs. Turtle's rock. In this room, the tadpoles meet Mrs. Turtle with her baby hatchling, sun-bathing on the rock. The colours appear in this room are Dark green and brown for Mrs. Turtle, light green and brown for a baby turtle.

(5). Room five; Mrs. Frog's lotus garden. This is the last room of the pond in which the tadpoles meet their mother; Mrs. Frog. The room is full of lotus flowers and water lilies, there are patches of lotus leaves floating all around. Mrs. Frog is sitting there while taking care of her garden.

(6). The colours appear in this room are Bright Green for Mrs. Frog, Pink for her ribbon, Red, and Pink for the lotus flowers, and Light Brown and Light Green each for the water lilies and the lotus patches.

The positions and the design of the palace can be seen in Figure 1.

Figure 1 Vocabulary palace design

At the beginning of the class, the teacher is to cover all of the rooms with a paper lotus patch. The only location not to be covered is the starting point. The teacher then asks the students to join the story and opens the story with soft yet sad background music. The teacher first introduces the tadpole big brother by showing the puppet and start working with the dialogue piece. The students are to repeat the word tadpole, spell it verbally (t-a-d-p-o-le) and re-pronounce it as many times as needed. When the students pronounce the word, they are also asked to watch the puppet moving all around the entrance of the pond (tadpoles' home). The teacher then moves along with the story. He moves the tadpole puppet to the next room and asks the students: "Who might the tadpoles meet?" If the students guess correctly, the teacher opens the camouflage. The teacher then continues the storytelling.

The pattern is to be repeated for the rest of the animals in the pond until the tadpoles get to meet Mrs. Frog. The teacher ends his part of the story-telling session with happy background music and asks whether the students are happy with the story. The teacher then moves to the second phase, the memorizing phase. The teacher asks the students to close their eyes while playing sad music at the start of the story. The teacher then asks the young learners to remember the story from the beginning. The teacher guides the students with stimulating questions in soft-voice. The students are to retell the story with closed-eyes.

This is the process of transferring the image built by the materials into the young learners' memory and mind. This is the training for young learners to create their own imaginative memory palace. In the following meeting, the teacher repeats the same process but this time, the teacher replaces the pictures with the printed vocabulary items of the characters, using the same colour and theme as the animal pictures before. The teacher asks the students to try and retell the story orally, in front of the class by using the word-puppets instead of the pictorial-puppets. If the students succeed in re-telling the story successfully, it can be concluded that the memory palace technique is successfully implanted into their learning.

4. Conclusion

In conclusion, vocabulary learning could be problematic for bilingual young learners of English during their preoperational period. Vocabulary learning can be enhanced by using mnemonic devices, such as the Method of Loci. The Method of Loci is a method that was popular among the Jesuits of the 15th century, which helped them in their religious activities and missions. One of the key figures in the development of the method is Father Matteo Ricci of Italy. During his twenty-seven years of service in China, he developed the memory palace technique to augment language learning.

By using the principles of Pictorial Material Design, the essence of Father Ricci's memory palace technique can be drawn and applied to design a set of vocabulary learning aid. The principles include the setting or location (palace, and rooms), distinct characters, vibrant colours, dynamic actions of the characters, numbers, and orders, clockwise-movement, and imagination practice. It can be concluded that the guiding principles of Matteo Ricci's memory palace technique can be applied as helping guidelines in designing vocabulary learning media to enhance English language learning for preoperational young learners. It can be applied in the form of the guiding framework and can be developed based on the needs and out of the teacher's creativity. The current researchers recommend that future researchers conduct further studies on the subject matter. The prototype should be implemented, tested, evaluated and then improved for the betterment of English language learning.

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