The Study of Correlations Between Visual Social Communication and Working Memory through Visual Arts at Phumin - Ta Li Community, Nan Province

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ABSTRACT

Phumin - Ta Li is a community that resides close to Wat Phumin, Nan province, Thailand is a historical site and is in the center of the Nan business and government sections. As a matter of fact, Phumin - Ta Li community is situated in Mueang Nan district and is a center of administration of Nan province. This research is designed to study the capability of participants who have seen visual arts (photographs and drawings) of architectural buildings in the area of Phumin-Ta Li community. Furthermore, this research assumed that images played a vital role in the communication and understanding of the characteristics of community to the outsiders. The study employed a methodological approach, utilizing quantitative methods to gather data from a group of seven individuals residing in Tha Wang Pha district, Nan province. The data then were analyzed using percentage, mean, standard deviation, correlation coefficient, and t-test. The study concludes that the apprehension of visual arts (photographs and drawings) for participants in three variables; Aesthetics, Remembering, and Sense of place is related to visual social communication and working memory at a significant level. Subsequently, the results showed a positive correlation between photographs and drawing to strengthen the collaboration between visual social communication and working memory in this research. These findings suggest that visual social communication and working memory are closely related to images (photographs and drawings) of Phumin-Ta Li community's buildings to the eyes of the outsiders. In order to work towards the achievement of the Global Goals (also known as the Sustainable Development Goals or SDGs) and establish itself as a sustainable city, the study emphasizes the vital importance of fostering community-based connections between Phumin-Ta Li community and its architectural structures. This approach aims to serve educational purposes as well.

Keywords: *Visual Social Communication, Working Memory, Visual arts, Phumin -Ta Li community, Nan province*

INTRODUCTION

Phumin - Ta Li community in Nan province, Thailand, is a historically significant site located at the heart of the province's business and government sections. This community is renowned for its architectural buildings, which are a testament to its rich cultural heritage. Visual arts such as photographs and drawings have played a crucial role in enhancing communication and understanding of the community's characteristics to outsiders. As a matter of fact, the study utilized a mixed-methods approach, which included qualitative and quantitative interviews with seven participants from Tha Wang Pha district. This research seeks to explore the correlations between visual social communication and working memory through visual arts in Phumin - Ta Li community. Chiefly, visual social communication and working memory through visual arts of architectural buildings are crucial for promoting sustainable development and achieving the SDGs. These elements can help to preserve cultural heritage, promote community identity, enhance working memory, and raise awareness of sustainability issues in other areas in the world.

LITERATURE REVIEW

Visual Social Communication Theory

This study used visual arts (photographs and drawings) to find the understanding from the people who have visited Phumin - Ta Li community in Meaung Nan district. This study used images and words as tools to find understanding from the people who have visited Phumin-Ta Li community in Meaung Nan district. This study needs a refining theory to describe the events in this study. Campbell & Russo (2001) mentioned refining theories involving modifying and improving existing theoretical frameworks to better explain or predict a phenomenon. In the context of visual social communication, the first theory that involves images and words comes from the principle of multimedia learning theory, proposed by Richard E. Mayer in 2001 as figure 1. In addition, the second theory involved the theory of communication that focused on learning outcomes and social interaction, proposed by S. A. Myers in 2010. This led to the emergence of a new theory known as visual communication theory which emphasizes the significance of visual images in enhancing the learning process from visual materials as figure 2.
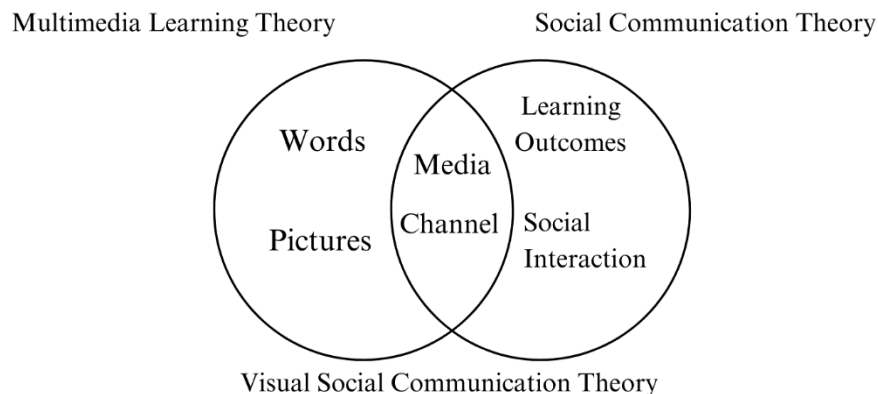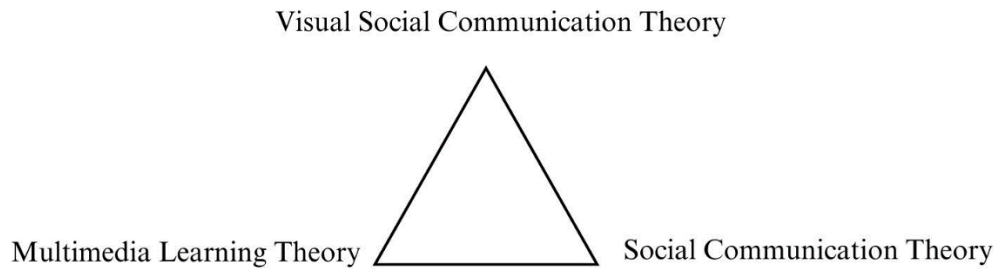

Figure 1. Visual communication theory

Figure 2. Refining Theories of Visual communication theory

Working Memory

Working memory is a vital cognitive system that temporarily stores and manipulates information to perform complex cognitive tasks. Baddeley and Hitch (1974) proposed a model of working memory consisting of three components: a central executive, which is responsible for directing attention and managing information processing, and two subsidiary systems. The phonological loop manages verbal information, whereas the visuospatial sketchpad processes visual and spatial information as figure 3.
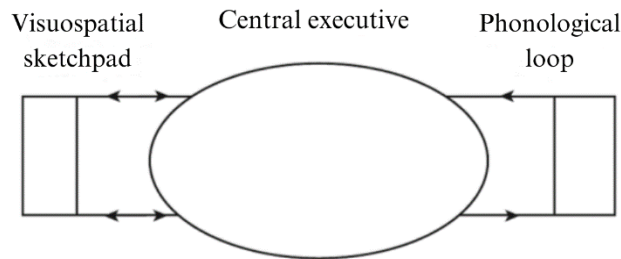

Figure 3. The original conceptualisation of the working memory model by
Baddeley, A.D. & Hitch,G.J. (1974)

In this study, the researcher employed the Shannon Weaver model of communication theory to facilitate the collection of information from participants on visual social communication and working memory. According to Shannon and Weaver (1949), this model involves encoding a message into a signal, transmitting it through a channel, and decoding it at the receiver end to extract meaning as figure 4.
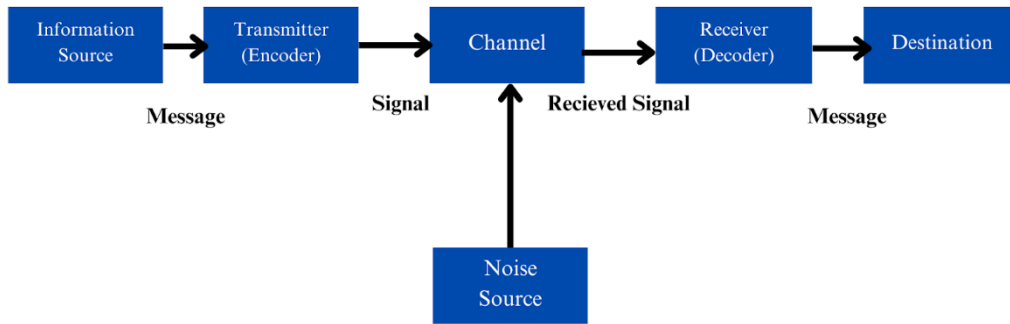
Figure 4. The Shannon Weaver Model of Communication Theory, 1949

To apply this model, the researcher used the visuospatial sketchpad and phonological loop to encode a message that contained both images and words. The images, including photographs and drawings, were presented on a website (https://phumintali.wixsite.com/visual-image), while the words were included in a questionnaire for the participants to respond to. After the participants received the information, they had to learn and translate the message, including both the images and words, in their brains. This process utilized the central executive to analyze the data in working memory. In summary, our study utilized the Shannon-Weaver mathematical model, visuospatial sketchpad, phonological loop, and central executive to collect information from participants on visual social communication and working memory as figure 5.
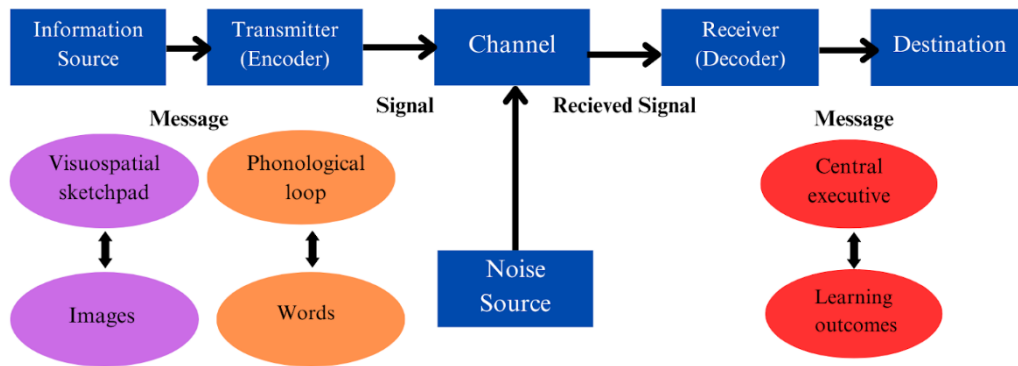

Figure 5. The original conceptualization of the working memory model (1974) and visual communication model worked in conjunction with The Shannon Weaver Model of Communication Theory (1949)

Visual Arts

Bresler (2007) explains John Dewey, an American philosopher and educational reformer, who stressed the significance of art education on aesthetics. Dewey views that art possesses a distinctive ability to enhance our experiences and enrich our lives. Dewey (1934) wrote the function of visual arts, such as photography and drawing, in shaping our perception of the world in his book "Art as Experience."

Photograph

According to Dictionary.com (2022), a photograph is a representation of a subject captured through the exposure of light on a light-sensitive medium, such as film or a digital sensor. Mustaffa Halabi Hj Azahari (2011) explains that photographs convey messages with diverse meanings that require complete understanding and acceptance by the public. As the proverb goes, "A picture is worth a thousand words," photographs must be carefully analyzed and comprehended. In addition, Mustaffa Halabi Hj Azahari (2011) added that although a simple proverb, comprehending the message conveyed by a photograph in either a realistic or interpretive form requires a certain level of understanding and analysis.

Drawing

Sale, T., & Betti, C. (2012) points out that the heart of interpreting someone's experiences lies in drawing,which has a unique voice among all forms of art. Through drawing, people can find a common ground for communication, allowing for a dialogue with viewers. In addition, Drawing is defined as the art or technique of producing images on a surface, especially by means of lines and shades, using pencils, pens, charcoal, or other tools" (Oxford English Dictionary, 2021).

METHODOLOGY

Questionnaires were utilized to collect data from Nan people living outside of Mueang Nan district. A total of seven participants were involved in the study, and quantitative methods were employed to obtain their input. The collected quantitative data was then analyzed using mean and descriptive statistics derived from the questionnaires.

Tool of Measurement

For this study, the questionnaire data was sourced from Bucholz and Smith's 1991 work, and it was obtained from Nan individuals residing outside of Mueang Nan district. The research was designed with two formats, using photographs (as shown in Figure 6 to Figure 11) and drawings (as shown in Figure 12 to Figure 17) to depict six architectural buildings located in Mueang Nan district. To assess the 12-item attributes derived from three different categories, two bipolar adjectives were utilized along with 7-point rating scales that ranged from 1 (strongly disagree) to 7 (strongly agree). The statistical analysis consisted of means, standard deviation, correlation analysis, one-sample t-test, and linear regression.

To assess the 12-item attributes derived from three different categories, there are

- Group 1 contains Beautiful, Attractive,Believable,Likable represent Aesthetics

- Group 2 contains Retro, Memories, Longing, Feel represent Remembering

- Group 3 contains Familiarity, Attachment, Social Identity, Character of place represent Sense of place

To test the hypothesis, information was gathered by a questionnaire with the approval of the visitors. Cohen (1992) & Field (2013) concluded there is no strict minimum sample size requirement to perform a t-test.

Figure 6. Wat Phumin
(Source: Author's personal collection)

Figure 7. Nan Prison Commander's House
(Source: Author's personal collection)

Figure 8. Nan Tourism Authority of Thailand
(Source: Author's personal collection)

Figure 9. Nan Café Amazon
(Source: Author's personal collection)

Figure 10. Ta Li House
(Source: Author's personal collection)

Figure 11. Jumpee Wanidaporn School
(Source: Author's personal collection)

Figure 12. Wat Phumin
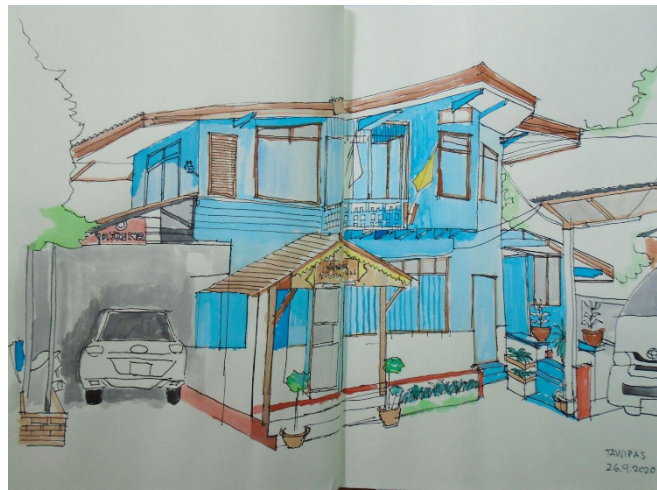*(Source: Author's personal collection)*

Figure 13. Nan Prison Commander's House
(Source: Author's personal collection)

Figure 14. Nan Tourism Authority of Thailand
(Source: Author's personal collection)

Figure 15. Nan Café Amazon
(Source: Author's personal collection)

Figure 16. Ta Li House
(Source: Author's personal collection)

Figure 17. Jumpee Wanidaporn School
(Source: Author's personal collection)

RESULTS

The questionnaire includes seven samples that represent people from Nan who live outside Mueang Nan district. These individuals have originated from the Tha Wang Pha district. There are 2 males (28.57%) and 5 females (71.43%). For the status issue, there are 1 person (14.28%) aged less than 18 years old, 1 person (14.28%) aged 18–24 years old, 3 persons (42.85%) aged 35–44 years old, 1 person (14.28%) aged 55–64 years old, and 1 person (14.28%) aged 65 and over years old. For the education level, 1 person (14.28 has secondary school, and 6 persons (85.71%) have bachelor degree education.

Test Of Hypothesis

The null hypothesis (H0):	Twelve item attributes of Photographs have a significant to Nan people residing outside of Mueang Nan district
The alternative hypothesis (H1) :	Twelve item attributes of Drawings have a significant to Nan people residing outside of Mueang Nan district

Table 1. Photographs and Drawings of six architectural buildings Paired t-test

	Value of p	Inference	Result	Explanation
Wat Phumin	0.207	p > 0.10	Accepted	The p-value is 0.207 which is more than 0.10. The null hypothesis H0 is accepted.
Nan Prison Commander's House	< 0.001	p < 0.001	Rejected	The p-value is less than 0.00001. The alternative hypothesis (H1) is rejected.
Nan Tourism Authority of Thailand	0.00003	p < 0.001	Rejected	The p-value is 0.00003 which is less than 0.001.The alternative hypothesis (H1) is rejected
Nan Café Amazon	0.01584	p < 0.001	Rejected	The p-value is 0.01584 which is less than 0.001. The alternative hypothesis (H1) is rejected
Ta Li House	0.015	p < 0.001	Rejected	The p-value is 0.015 which is less than 0.001. The alternative hypothesis (H1) is rejected
Jumpee Wanidaporn School	0.211	p > 0.10	Accepted	The p-value is 0.211 which is more than 0.10. The null hypothesis H0 is accepted.

Linear Regression

Shalini, S., & Soundaraya, K. (2021) suggested the use of linear regression as a statistical methodology is to create a model that represents the association between a dependent variable and one or more independent variables.

Table 2. Linear regression of six architectural buildings with three different categories

Correlation Coefficient Value (r)	Wat Phumin	Nan Prison Commander's House	Nan Tourism Authority of Thailand	Nan Café Amazon	Ta Li House	Jumpee Wanidaporn School
Aesthetics	0.85	0.3986	0.387	0.3334	0.2854	0.8013
Direction and Strength of Correlation	Strongly positive	Weakly positive	Weakly positive	Weakly positive	Weakly positive	Strongly positive
Remembering	0.42	0.669	0.8652	0.2249	0.8849	0.078
Direction and Strength of Correlation	Weakly positive	Moderately positive	Strongly positive	Weakly positive	Strongly positive	No association

Sense of place	0.3986	0.669	0.9209	0.5654	0.054	0.1702
Direction and Strength of Correlation	Weakly positive	Moderately positive	Strongly positive	Moderately positive	No association	No association

FINDING AND DISCUSSION

The result supports the idea of finding a correlation between visual social communication and working memory through visual arts (photographs and drawings) in Phumin-Ta Li community, Nan province. The study concluded Photographs of Wat Phumin and Jumpee Wanidaporn School have accepted twelve item attributes (words) that related to Photographs of Wat Phumin and Jumpee Wanidaporn School. As a result, people who live outside of Mueang Nan district agree that photographs represent Wat Phumin and Jumpee Wanidaporn school more effectively than drawings. On the contrary, the images of Nan Prison Commander's House, Nan Tourism Authority of Thailand, Nan Café Amazon and Ta Li House, people who live outside of Mueang Nan district agree that drawings have more effective portrayal of twelve attributes than photographs. For linear regression, this study reports the relationship between dependent variables (Wat Phumin, Nan Prison Commander's House, Nan Tourism Authority of Thailand, Nan Café Amazon,Ta Li House, Jumpee Wanidaporn School) and independent variables (Aesthetics, Remembering, Sense of place). The report shows Wat Phumin and Jumpee Wanidaporn School have a strong relationship with Aesthetics. Nan Tourism Authority of Thailand and Ta Li House have a strong relationship with Remembering. The report shows Nan Tourism Authority of Thailand has a strong relationship with Sense of place for both photographs and drawings. In conclusion, photographs of Wat Phumin and Jumpee Wanidaporn school have affected Nan people who are not living in Mueang Nan district. Because Wat Phumin and Jumpee Wanidaporn school stand for a long time. The memory of these two places sticks to their memories. So the participants agree photographs of two architectural buildings cannot be replaced with drawings. In addition, drawings of architectural buildings in Mueang Nan district, Nan people who live outside Mueang Nan district like drawings better than photographs because drawings make the images more attractive to their eyes. For groups of words (twelve item attributes), the group of words on Aesthetics has been affected at Wat Phumin and Jumpee Wanidaporn school. The group of words on Rememberings has affected Nan tourism. The group of words on Sense of places has strong effects on Nan Tourism in both photographs and drawings as Table 1. As a result, Nan people who live outside Mueang Nan district agree on words related to both photographs and drawings that they have read and translated words into different meanings with their working memory inside their brains. A test of linear regression confirms the correlation between visual social communication and working memory is positively related as table 2. In addition, visual arts (photographs and drawings) can increase the perception of the building to the viewers in a positive direction. This study suggests that in future studies the target groups of the participants can select the participants from other districts in Nan province to check the correlation of visual social communication and working memory through visual arts (photographs and drawings). Consequently, this study anticipates generating a significant body of findings that align with its objectives.

CONCLUSION

This study represents a valuable effort that holds the potential to generate meaningful findings and contribute to the broader pursuit of the Global Goals. This research aims to motivate positive transformation and empower individuals and communities to create a more sustainable and inclusive future by examining the correlation between pedagogy education, the implementation of SDG 11, and the

integration of visual arts in community-based architectural structures. In addition, Phumin - Ta Li community in Nan province, Thailand serves as a specific context for this study, which anticipates generating findings that are not only relevant to the community but also hold potential for broader application in diverse educational environments.

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REFERENCES

Baddeley, A. D., & Hitch, G. J. (1974). Working memory. In G. Bower (Ed.), *The psychology of learning and motivation: Advances in research and theory* (Vol. 8, pp. 47-89). Academic Press.

Bucholz, R. A., & Smith, C. L. (1991). Alternative technologies for hazardous waste remediation. *Environmental Science & Technology*, 25*(5)*, 998-1005.

Bresler, L. (2007). John Dewey and Aesthetic Education. In E. W. Eisner & M. D. Day (Eds.), *Handbook of research and policy in art education* (pp. 33-49). Routledge.

Campbell, J. P., & Russo, M. J. (2001). The science of organizational change and the learning organization. *The Psychologist-Manager Journal*, 5*(1),* 1-18.

Cohen, J. (1992). A power primer. *Psychological Bulletin*, 112(1), 155-159.

Dewey, J. (1934). *Art as experience*. Minton, Balch & company.

Dictionary.com. (2022). Photograph. In Dictionary.com. [Online] Available: https://www.dictionary.com/browse/photograph?s=t (April 28, 2023)

Field, A. (2013). Discovering statistics using IBM SPSS Statistics. *Sage*

James, G., Witten, D., Hastie, T., & Tibshirani, R. (2013). *An introduction to statistical learning: with applications in R*. Springer.

Mayer, R. E., & Moreno, R. (2002). Aids to computer-based multimedia learning. Learning and Instruction, 12*(1),* 107-119. https://doi.org/10.1016/S0959-4752(01)00018-4

Mayer, R. E. (2001). *Multimedia learning*. Cambridge University Press.

Mustaffa Halabi Azahari (2011). *Photography: Its Significance Strands and Values in Education*. Shah Alam: UiTM Press, xii.

Myers, S. A. (2010). *Social communication and technology*. Springer Science & Business Media.

Oxford English Dictionary. (2023). *Drawing*. Oxford University Press. [Online] Available: https://www.oed.com/view/Entry/58016?rskey=1zUJ51&result=1&isAdvanced=false#eid (May 13, 2023)

Sale, T., & Betti, C. (2012). *Drawing: A contemporary approach*. Cengage Wadsworth.

Shalini, S., & Soundaraya, K. (2021). Linear regression. Journal of Statistics Applications & Probability, 10(2), 145-156.