

HARNESSING DUAL CODING AND COGNITIVE LOAD THEORY FOR TRANSFORMATIVE EDUCATION IN EASTERN ART HISTORY

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ABSTRACT

The use of visual materials is an uncommon practice in art history teaching, including in Eastern Art History courses. Visual materials are believed to help students understand complex cultural and strengthen understanding of abstract concept. This study aims to analyze the cognitive visual learning theory that underlies the teaching practice of the course, especially in terms of the use of visual aids and lecture methods, and to examine its compatibility with visual and cognitive learning theories. This research used a participatory approach with descriptive qualitative methods. Data were collected through classroom observation, semi-structured interviews with students, and analysis of learning documents. Analysis was conducted using thematic matrix technique to identify patterns and themes from the data obtained. The results showed that visual and cognitive learning theories were used in learning. Visual aids such as pictures, slides, and videos help students understand the material more deeply and strengthen memory. Meanwhile, lectures provide a cognitive structure that supports information processing. Students stated that the combination of visual and verbal is very important in improving their understanding of Eastern Art History materials. This research confirm the importance of aligning practice and learning theory.

Keywords: cognitive, eastern art history, learning model, learning theory, visual

INTRODUCTION

The history of Eastern art is an important window into the rich culture, values, and aesthetics of Asia's great civilizations. Civilizations such as China, Japan, India, Persia, and Southeast Asia have produced artistic legacies that are not only high artistic value, but also reflect the philosophy of life and worldview of their people. In every work of Eastern art, be it painting, calligraphy, sculpture, architecture, or handicraft, there are spiritual, religious, and symbolic messages that reflect human relationships with the universe, divinity, and fellow humans. Therefore, studying the history of art from this region is not just about understanding its visual form, but also exploring the philosophical and ideological values that accompany it.

However, conveying such depth to today's students is not an easy task. The considerable cultural distance between the modern generation of students and the historical and cultural context of Eastern art works poses a challenge to the learning process. Today's students tend to be shaped by a digital and fast-thinking culture, requiring a teaching approach that bridges the gap. Many of the symbols, philosophical concept, and aesthetic approaches in Eastern art cannot necessarily be interpreted through a rational or instantaneous framework. This causes the course material, which should be reflective and inspirational, to be perceived as abstract, distant, and inaccessible to students' daily experiences.

In this context, the use of visual media in the learning process has a very important and strategic position. Visual media such as images, documentaries, infographics, digital illustrations, and virtual tours to cultural sites have proven to be effective tools to revive the symbolic meanings contained in Eastern art works. Through visualization, students not only hear or read an explanation of a work, but can also directly see its shape, color, composition, and historical context. This facilitates a more holistic and in-depth learning experience, as it involves both visual and cognitive perception simultaneously.

The use of visual media also helps to build emotional and intellectual connections between students and their objects of study. By looking directly at the details of ornaments in temple architecture in India, or colors and symbols in Japanese paintings, students can develop a more concrete understanding of the meaning behind the form. This visualization also opens up opportunities for critical reflection, as students are invited to reflect on how cultural values are represented in certain visual form, as well as how these meanings are relevant or different to their own culture.

The application of visual media in learning Eastern art history should not be down haphazardly. There are various learning theories that provide guidance on how visual information can be used effectively to enhance understanding. One theory that is often referenced is the Dual Coding Theory by Allan Paivio. This theory explains that information is processed through two main channels: verbal and visual. If these two channels are used simultaneously and in balance, then retention and comprehension of information will improve. In the context of teaching Eastern art history, Dual Coding Theory can be the basis for designing learning materials that combine verbal narration or text with visual elements such as images of artworks, diagrams, and documentary videos. Thus, students gain a more thorough understanding because the information is presented in two complementary forms of representation (Firmansyah, 2024).

Another theory that supports the importance of visualization in learning is the Cognitive Load Theory by John Sweller. This theory highlights the limited capacity of the human brain in processing information. If the material is too complex or delivered in a less effective way, the cognitive load will increase and hinder the learning process (Sweller, 1994). Therefore, proper utilization of visual media can help simplify complex information, such as symbolic concepts in Eastern art, so that it is more easily understood by students. In addition, Richard Mayer through Multimedia Learning Theory emphasizes the importance of multimedia design principles in learning. According to Mayer, the simultaneous use of text and images will be effective if done by paying attention to the principles of cohesion, segmentation, and pre-training. In this context, the presentation of material on the history of Eastern art should be designed in the form of an interactive visual module that not only displays images, but also explains their cultural context and symbolic meaning.

Although theoretically the use of visual media has many advantages, in practice the teaching of Eastern art history has not fully utilized this approach to the fullest. Based on observations and interviews with several lectures teaching art history courses in a number of universities, it was found that the use of visual media is more often done pragmatically, without deep theoretical considerations. Many lectures use images or videos only as a complement to the lecture, not as an integral part of the learning strategy. This is exacerbated by limited resources, such as lack of access to high-quality visual archives, limited interactive presentation tools, and unavailability of learning modules designed based on visual learning theory. In addition, not all lectures have a background in pedagogy or education, so their approach tends to be based on personal experience rather than a strong theoretical foundation. As a result, students often have difficulty in understanding the deep meanings of Eastern art works. They may be able to recall the names of certain dynasties or types of art, but fail to understand the underlying philosophical context or cultural values. This suggests that the use of visual media that is not strategically designed only produces surface effects, without significantly impacting deeper cognitive processes.

In the last five years, a number of studies have highlighted the importance of using visual media in the learning process, particularly in the field of history. For example, Putri (2023) in her research found that the use of documentary videos and interactive simulations can increase students' engagement and understanding of national history materials. Firmansyah (2024) concluded that interactive visual applications can accelerate students' understanding of complex historical events. Research by Simbolon et al (2023) also showed that the presentation of historical materials using infographics, maps, and images can help students connect information logically and strengthen memory (Pruanty et al., n.d.). However, almost

all of these studies still focus on teaching national history or general history, not on fine arts or Eastern art history specifically. Therefore, there is a research gap that needs to be filled, namely the study of the effectiveness of visual media in learning Eastern art history. Studies on how the principles of visual and cognitive learning theory can be applied directly in the context of art teaching in Asia, especially in higher education, are still very limited. Therefore, this research attempts to fill the gap by critically evaluating existing teaching practices and formulating a more theoretical and applicable approach. Based on the theoretical study and analysis of existing learning practices, several recommendations can be made to improve the effectiveness of teaching Eastern art history through a visual approach. There is a need for training for lectures on the application of visual learning theory and multimedia learning in the context of fine arts. This training can include techniques for designing informative visual materials, using learning technology, and evaluating the effectiveness of the media used. Universities should develop digital-based interactive learning modules that contain a visual collection of Eastern art works complete with narrative of their historical and philosophical context. This module can take the form of an application, interactive e-book, or online platform that can be accessed by students at any time. Multimodal presentation of information will help students process information more effectively (Damayanti, 2013).

Teaching Eastern art history requires an approach that is not only informative, but also transformational. Given the symbolic complexity and cultural values contained in Eastern art, the use of visual media is crucial to bridge students' understanding of the material being taught. However, visual media will only be effective if they are designed based on sound principles of visual and cognitive learning theory. This article emphasizes that there is still a gap between common learning practices and the learning theory that should be the basis. Therefore, there needs to be a systematic effort to evaluate and redesign Eastern art history teaching strategies to be more based on effective visual approaches. By integrating theories such as Dual Coding, Cognitive Load, and Multimedia Learning, it is expected that the learning process will not only become more interesting, but also more meaningful and have a long-term impact on students. This research thus provides theoretical and practical contributions to the development of Eastern art history pedagogy and can be the basis for curriculum innovation and learning media development in the future.

METHOD

This research uses qualitative research methods because the main focus is to deeply understand students' learning experiences in the context of learning Eastern Fine Arts History, especially in terms of the use of visual media. The qualitative approach allows researchers to capture classroom dynamics, individual perceptions, and patterns of interaction that cannot be explained quantitatively. This research is also participatory, where the researcher is directly involved in the learning environment, not only as a passive observer, but also as a facilitator in the process of documentation and reflection of learning. Thus, there is a two-way interaction between researchers, students, and lectures, which opens up space for dialog and digging deeper information.

The subjects of this research are students of class 2023 from the Fine Arts Education study program, State University of Malang. The total number of students taking the Eastern Fine Arts History course is approximately 112 students, which are divided into 4 classes, each containing 28 students. The selection of subjects was carried out purposively, taking into account the level of active participation of students in the learning process and their willingness to be involved in observation and interview activities. For purpose of in-depth interviews, the researcher selected several students from each class in a representative manner, so that the data coverage reflected a diversity of views. To obtain relevant and in-depth data, this study used three main instruments, namely observation, interviews, and documentation. Observations were made directly in the classroom during lectures, using open field notes and observation protocols containing aspects of student involvement, use of visual media, and spontaneous responses to the material. After

observation, the researcher continued with semi-structured interviews with a number of students. The interview questions were designed to explore students' views on the effectiveness of visual media, such as "What do you feel when the lecturer uses pictures or videos when explaining the material?", and "How do visual media affect your understanding of fine arts from Eastern cultures?". In addition, the researcher also collected learning documents such as RPS, lecturer presentation slides, and examples of student assignments, to strengthen the understanding of the context of the material and teaching methods.

Data collection was conducted over a period of three weeks, starting with classroom observations of four lectures sessions. This process was followed by interviews with selected students, which were conducted outside of lecture hours so as not to disrupt the teaching-learning process. Meanwhile, related documents were collected in parallel and analyzed as part of data triangulation. To analyze the data, this study used interactive analysis techniques. This technique was chosen because it is practical and in accordance with the nature of the data obtained from interviews and observations. The analysis process began with reading and selecting important statements from the interviews and field notes. This process allowed the researcher to see common patterns while appreciating the variation in perceptions between correspondents.

As a step to maintain data validity and credibility, researchers used source triangulation, which compares data from observations, interviews, and documentation. In addition, the researcher also conducted member checking, by confirming the interpretation of the interview results to the respondent concerned, to ensure that the meaning captured by the researcher was in accordance with the intention of the informant. With this methodological approach, it is hoped that the research can provide an accurate and in-depth picture of the dynamics of teaching Eastern Fine Arts History and the effectiveness of using visual media from the point of view of learning theory and real classroom experience.

RESULTS AND DISCUSSION

After a process of data collection through classroom observations, semi-structured interviews, and analysis of the teaching documentation, it was found that the use of visual media in learning Eastern Art History plays a significant role in assisting students' understanding. From the data analyzed, there appears to be a consistent pattern in the way students acquire information that is conveyed visually and verbally simultaneously. These findings were then analyzed by referring to relevant learning theories, particularly Allan Paivio's Dual Coding Theory and John Sweller's Cognitive Load Theory. Both theories are able to explain in depth how visual media affects comprehension, information retention and cognitive load in the teaching and learning process. The following discussion will outline how the findings in the field relate to the principles in both theories, and assess the extent to which current teaching practice are in line with these theoretical foundations.

Dual Coding Theory by Allan Paivio

The dual coding theory developed by Allan Paivio explains that humans have two cognitive representation systems that work in parallel and complement each other in processing information, namely the verbal system and the visual system. The verbal system deals with words, narrative, or other linguistic forms, while the visual system includes images, illustrations, visual objects, maps, and other non-verbal forms of representation. These two systems do not work in isolation, but can interact with each other to strengthen understanding and retention of information. According to this theory, when a person receives information through both channels simultaneously, for example listening to an oral explanation while viewing relevant visual illustrations, the chances of understanding and remembering the information will increase significantly (Pruant et al., n.d.). This happens because working memory processes information from both channels in different forms, and then stores it in long-term memory as two interconnected codes.

This process creates a dual representation of the same concept, which in turn strengthens associations, expands context, and facilitates future recall.

In the context of learning Eastern Art History, this theory is very relevant because the material presented tends to be abstract, philosophical, and comes from a cultural setting that may be unfamiliar to students. For example, when discussing symbolic meanings in temple architecture in India or ink painting techniques in Japanese culture, mere verbal explanations are often insufficient to build a complete understanding. However, by adding pictures, diagrams or videos that directly show the visual form of the object or concept in question, students can relate the verbal information to a concrete visual representation.

More than just clarifying, the combination of verbal and visual also helps students form more robust mental representations. This means that when only one channel of information is forgotten, the other channel can still help access the information again. In many cases, images or visuals can trigger students' memories of the verbal explanations they previously listened to. In other words, delivering material through these two channels creates cognitive redundancy that is functional, not burdensome, but reinforcing. Therefore, the application of Dual Coding Theory in teaching Eastern Art History not only enriches the learning experience, but also bridges the gap between the academic text and the visual reality of the artworks studied. It supports the formation of a deeper and more contextualized understanding of the complex cultural and aesthetic values of the East.



Figure 1. Ancient Egyptian Fine Art History Materials

The picture above is ancient Egyptian material delivered by the lecturer in the History of Eastern Fine Arts course. The material is formed in a powerpoint (PPT) and accompanied by several visual images about the material discussed. The use of visual aids during lectures can strengthen the student learning process. Students stated that the images and visualizations helped them understand the aesthetic concepts, symbolic philosophy, and chronology of Eastern cultures that previously seemed unfamiliar to them. This corroborates the assumption in Dual Coding theory that combining two forms of information representation expands students' interpretation and memory capacity.

Cognitive Load Theory by John Sweller

Cognitive Load Theory, developed by John Sweller, is one of the important theories in educational psychology that explains how the way information is delivered affects learning effectiveness (Falah et al., 2022). The essence of this theory is that humans have limitations in processing information in working memory, which is a temporary mental space used to understand, process, and store new information before it is transferred to long-term memory (Sweller, 1994). If the information load exceeds the capacity of working memory, learning will not take place optimally. Therefore, learning design needs to consider students' mental capacity so that information can be processed efficiently.

Sweller identified three types of cognitive load that work simultaneously during the learning process: intrinsic load, extrinsic load, and germane load. Intrinsic load relates to the level of complexity of the material itself where the more complicated and abstract the information being learned, the greater the intrinsic load (Syagif, n.d.). In the context of Eastern Art History, this burden arises when students have to understand cultural symbolism, unfamiliar visual styles, or Eastern philosophies that are different from their modern framework. Extrinsic load, meanwhile, arises from inefficient or confusing ways of delivering the material, such as the use of irrelevant media, overly long explanations, or visual displays that interfere with information processing. This type of load does not come from the material itself, but from poor learning design. Therefore, a perfunctory visual approach can add extrinsic load and hinder learning.

The germane load is the type of load that is actually productive for learning, because it is related to the learner's mental effort in building new knowledge schemas in long-term memory. Germane load should be increased, as it supports the knowledge construction process (Abdus et al., 2017). In this context, appropriate visual media can increase germane load, as it helps students relate new information to existing knowledge structures, resulting in deeper and longer-lasting understanding.

By understanding these three types of load, teachers can design lessons that reduce extrinsic load, adjust intrinsic load, and optimize germane load. Therefore, the integration of Cognitive Load theory in teaching Eastern Art History is very important so that students do not just receive information, but are able to process and internalize the cultural and symbolic meanings contained in Eastern artworks more effectively.



Figure 2. Hindu Temple History Material

In Eastern Art History learning practice, the appropriate use of visualization can reduce extrinsic load and allocate more cognitive capacity for germane load. For example, by displaying supporting images when explaining the structure in Hindu temple buildings, students do not need to imagine the visual form of verbal description by themselves. This helps them construct more efficient cognitive schemas.

CONCLUSION

This research reveals that the use of visual media in learning Eastern Art History plays an important role in helping students understand abstract and symbolic concept originating from Eastern cultures. Through observations and interviews, it was found that the visual approach reinforces the delivery of verbal material, allowing students to process information more meaningfully. This finding is in line with the principle in Dual Coding Theory which states that information will be more easily understood and remembered if it is conveyed through two channels, namely verbal and visual, simultaneously. In addition, the appropriate application of visuals also contributes to managing students' cognitive load, as explained in Cognitive Load Theory, so that learning becomes more efficient and does not overload students' mental capacity.

Although learning today makes active use of visual elements, the approach has generally not been systematically designed based on relevant learning theories. Many visual media are used based on intuition or learning experience rather than planned theoretical considerations. Therefore, this research emphasizes the importance of a more conscious and theoretical integration between visual media and learning design. Strengthening lecturers' understanding of visual and cognitive learning theories will be an important step in improving the quality of learning Eastern Fine Arts History, as well as bridging the gap between the content of the material, the cultural context, and the way students learn today.

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