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research review

editor
Judy Hornbacher

Editor's Note

One of the goals of much current practice in arts instruction and arts research is to discover the cross-over of arts learning to other disciplines. Establishing that learning transfers from one subject to another is always a very challenging research undertaking. It takes many years and often the results are not shared widely.

In the following piece, Amy Chase Gulden reviews a work of research that explicitly and purposefully combined strategies of arts learning, Visual Thinking Strategies (VTS) and strategies of medical training and clinical diagnosis. The results are fascinating and should be understood beyond the world of medical training. In the review Ms. Gulden examines the results found in the study and then expands her analysis so that the reader can begin to understand why the study results were not surprising, given what is known about VTS.

Amy Chase Gulden is the New York Regional Director for Visual Understanding in Education (VUE), where she has been supporting teachers, schools, and museums learning to use VTS since 2006. Amy was director of Studio in a School's Long Term Visual-Arts Residency Program for seven years before she began consulting to the arts education field in 2005. As Senior Researcher at The SchoolWorks Lab, she has carried out the design and research of U.S. Department of Education and New York State Council on the Arts (NYSCA) grants, and she currently serves as faculty and facilitator for NYSCA's arts in education assessment and strategic planning initiatives. She is a visual artist and writes a weekly column, *The Gallery,* which celebrates emerging artists for www.apartmenttherapy.com.

It is easy to get a thousand prescriptions but hard to get one single remedy.

—Chinese proverb

Can Looking at Art Help Doctors Help Patients?

An Artwork a Day Keeps the Doctor … Sharper!

In July 2008 the *Journal of General Internal Medicine* published "Formal Art Observation Training Improves Medical Student's Visual Diagnostic Skills" (Naghshineh et al.). The article is a review of a Harvard Medical School study from 2005 that examined the impact of a 9-week course on improving the capacity of medical

students to more closely and accurately observe both works of art and photographs of patients with a variety of clinical disorders. The course, *Training the Eye: Improving the Art of Physical Diagnosis*, combined structured art-viewing in a museum setting using Visual Thinking Strategies (VTS) with traditional medical didactics on the art of physical diagnosis. Good news for people who believe in the power of viewing art: the course worked!

The article concluded that "observation skills, including those directly relevant to clinical medicine, can be successfully acquired through active, structured study of works of art and medical imagery," (that) "an inter-disciplinary course developing visual literacy can expand medical students' observational acumen and diagnostic capabilities" (Naghshineh et al. 995).

Training the Eye has been offered at Harvard Medical School by Drs. Joel Katz and Shahram Khoshbin of Brigham and Women's Hospital since 2004 when they proposed it in response to growing data suggesting that doctors' physical exam skills were on the decline. Katz believed that physicians could improve their diagnostic skills by learning to better observe works of art: "We are trying to train students to not make assumptions about what they're going to see, but to do deep looking. Our hope is that they will be able to do this when they look at patients" (Kowalczyk).

One could ask, why place one's bets on having medical students look at art? Perhaps because works of art, like X-rays and physical examinations, by their nature have layers of meaning, may be ambiguous, may challenge assumptions, and often yield multiple interpretations when given ample time for consideration.

The study compared pre- and postcourse writing responses to both art and clinical imagery from the 24 preclinical students who took the Training the Eye course, with 34 classmates at a similar training level who had not. This study expands on earlier studies that also investigated the impact of art-viewing in medical education because it involved a longer course (nine weeks compared to one to three sessions) and combined a research-based method of art observation (VTS) with lectures explicitly linking artistic concepts to physical examination skills.

The study compared both the number and nature of the observations made by students of both works of art and slides of patients with clinical disorders.

Here are a few noteworthy findings:

- After completing the course, students' ability to make accurate observations increased 38%, compared to the control students who showed no change from pretests. This increase was present in both the examination of clinical images and art images.
- Qualitative analysis of the students' observation posttests—where students analyzed both clinical imagery and art imagery—demonstrated five corresponding categories between analysis of clinical images and art images.
- The study describes increases in frequency across all these categories in treatment students' posttests. The largest change noted was an 86% increase in the

Categories for Art Imagery	Corresponding Categories for Patient Photographs
Observations	Visual findings
Interpretations supported by visual evidence	Clinical diagnosis or interpretations supported by evidence
Speculative thinking to generate multiple interpretations	Speculative thinking to develop a differential diagnosis
Awareness of the absence of observations	Pertinent negatives or awareness of the absence of visual findings
Use of fine-art concepts	Use of fine art concepts

Note. From "Formal Art Observation Training Improves Medical Students' Visual Diagnostic Skills," by S. Naghshineh et al., 2008, *Journal of General Internal Medicine,* p. 996. Copyright 2008 by the Society of General Internal Medicine. Reprinted with permission.

frequency with which treatment students used fine art concepts linked to physical findings, including specific mention of color/shadow/light and symmetry/balance in both art and clinical images (as compared to no change in control students). Next was a 40% rise in the absolute number of observations made by course participants. Course participants made many more observations after the course than nontreatment students.
- A "dose effect" was noticed—that is, the more course sessions the students attended, the greater their improvements in observation. The more practice, the better.

FIG. 1.

How and Why Did the Course Work?

As educators in the arts this study makes us curious to look under the hood, so to speak, to better understand the teaching decisions and student experiences involved in the course. How was the course designed? What did students do? What kind of "structured" art viewing? Why might it have been effective at improving observation and diagnostic skills?

The course, *Training the Eye: Improving the Art of Physical Diagnosis*, consists of eight paired sessions, each beginning with 75 minutes of observation and discussion of works of art using VTS at the Museum of Fine Arts Boston, followed by a short walk back to Harvard Medical School for an hour of lecture linking visual arts concepts with various aspects of physical diagnosis. Students also complete weekly, short, out-of-class visual training and description exercises, and may opt to take one or two drawing sessions with professional art instruction and live models.

The overall structure of the course was designed by Katz, Khoshbihin, and Rachel Dubroff, MD, at the time a fourth-year medical student at Harvard Medical School and a physician at Columbia University Medical Center, New York Presbyterian Hospital. Alexa Miller, now Curator of Education at the Davis Museum and Cultural Center, Wellesley College, was hired for the course pilot in 2004 to facilitate the museum sessions. After the pilot, Miller further developed the art curriculum to utilize VTS as the core viewing and discussion strategy because of the method's proven effectiveness at developing aesthetic thought, critical thinking, and communication skills. Miller, working with Sheila Naghshineh, MD, course TA in 2005 and the study's lead investigator, selected paintings and sculptures from the Museum of Fine Art's collection to strategically link the clinical and visual concepts identified by faculty coordinators Katz and Khoshbin. For instance, a clinical didactic on understanding the shape of the heart was paired with works of art at the museum that emphasize the visual concept of contour. Students discussed Edvard Munch's 1893 *Summer Night's Dream (The Voice)* (Fig. 1) and Pablo Picasso's 1910 *Portrait of a Woman* (Fig. 2) at the museum, and then participated in a discussion and drawing activities to examine X-rays of a variety of contours in the chest and heart (Fig. 3).

Another meeting focused on texture and pattern, beginning with a discussion of a painting by Jackson Pollack followed by an examination of texture and application of pattern-recognition to diagnosing skin conditions. Students discussed *Siva as Lord of Music* (a 10th century Indian sculpture of a dancing female) (Fig. 4) as a prelude to discussing "balance and imbalance" in neurological exams. Since 2005, the course has continued to evolve in refining its use of VTS for the process of clinical reasoning and with the addition of Judith Murray, museum educator at the Harvard Art Museum, has enhanced its image selection and gallery teaching.

Was the Choice to Use VTS in This Study Significant? What Is VTS?

The "intervention" or method used to structure the viewing and discussion of works of art was VTS. Based on what has been learned from research on this method, choosing it over other approaches had an impact on the effectiveness of the Training the Eye course. VTS was coauthored by cognitive psychologist Abigail Housen and museum educator Philip Yenawine. It is a viewer-centered teaching method that uses art to build the capacity to observe, think, listen, and communicate, and it is grounded in Housen's stage theory of aesthetic thought—or how people make meaning from works of art.

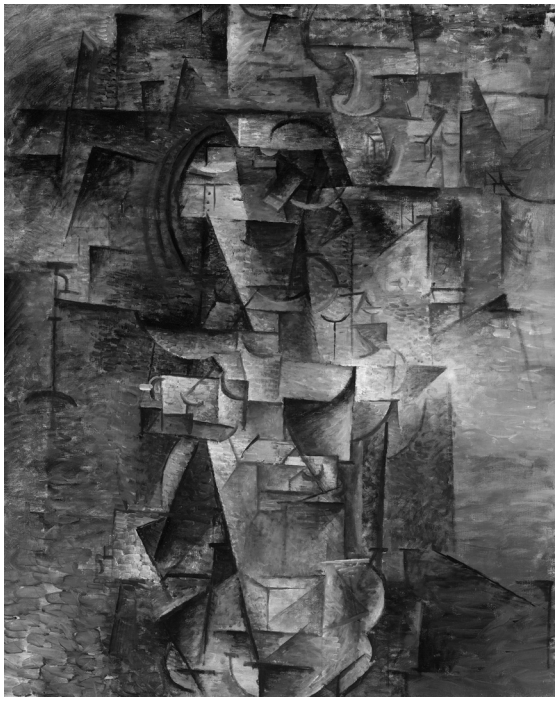

FIG. 2.

Housen's original research used a measurement technique that allowed people to talk, stream-of-consciousness style, as they observed a work of art. The coding and analysis of these samples of thinking (called Aesthetic Development Interviews) over many years of data collection yielded the discovery of five distinct patterns of thinking about art that occur in a natural trajectory of growth she describes as *aesthetic stages* (Housen *The Eye of the Beholder*; Housen "Validating a Measure"). Housen has also found that the majority of viewers, children and adults, fall into the beginning stages (Housen's Stages I and II) of viewing and that a person's level of aesthetic development is more closely related to their amount of time and experience viewing art, not necessarily to their age (Housen and DeSantis *Museum of Modern Art*). Using the thinking characteristics of people in early stages of aesthetic development, Housen and Yenawine set out to design a method of teaching that could offer appropriate challenges and support growth in beginning viewers. VTS is the result, and it is both a teaching method and a K–5 viewing-curriculum that has been field-tested in a wide range of educational settings with a wide range of ages.

How Does a VTS Discussion Work?

Viewers in a VTS discussion:

- Look carefully at and discuss works of art (that have been selected to meet the needs and interests of their aesthetic stage.)
- Respond to a consistent set of open-ended questions which guide the

discussion and support viewer self-sufficiency and confidence
- Back up their observations with evidence from the work of art
- Listen to and consider the responses of others, allowing everyone to see more than they might on their own and to consider multiple interpretations

The facilitator of a VTS discussion:

- Poses a specific sequence of open-ended questions:
- "What's going on in this picture?"
- "What did you see that makes you say that?" (asked when a comment offered is open to interpretation)
- "What more can you find?"
- Encourages all participants to share their thoughts
- Keeps the discussion focused on the work of art by pointing at the areas being discussed
- Doesn't offer any information—or their own opinions—about the art
- Paraphrases each person's comment, but does not evaluate these responses
- Links diverse remarks while not favoring any particular remark

VTS facilitation ensures an environment of open and lively discussion that places the work of art firmly in the hands of the participants puzzling and reasoning out the possible meanings in the piece.

Why Did Transfer Occur and Why Was There a Dose Effect? A Response Based on VTS Research

The transfer of accurate observation and reasoning about works of art to clinical images observed in the Formal Art Observation Training Improves Medical Student's Visual Diagnostic Skills study is consistent with prior research findings about VTS and transfer. Most learning begins with observation, and the VTS method and structure encourage careful, repeated observations. Viewers are asked to ground interpretive observations with evidence from the image. With repeated VTS discussions viewers begin to apply the skills of observing carefully, of thinking deeply, and of evidentiary reasoning to non-art objects and to other subjects. In a five-year study conducted in Byron, Minnesota, Housen found evidence that consistent and sequential VTS discussions accelerate growth in aesthetic and critical thinking and enable transfer of critical thinking to other contexts and content (Housen "Aesthetic Thought"). There is no surprise, then, that with more practice over time, observation and reasoning skills gain strength. The Byron findings document how learning in the arts can enable viewers to move beyond the interpretation of images into critical thinking in other areas. These findings have been corroborated and confirmed by other studies and researchers (see Adams et al.; Curva & Associates; Housen and DeSantis *Hightlights of Findings*; Tishman and Palmer).

VTS is also proven to address the needs of beginning viewers, and it should be noted that although the students enrolled in the Harvard Medical School course had a history of very high academic achievement, they were, for the most part, new to viewing art.

Real Life Impact and Application: Medicine and Beyond

This study and its results caught the eye of the *Boston Globe* and prompted Daniel Pink (author of *A Whole New Mind*) to post on his blog under the banner, "Take Two Matisses and Call Me in the Morning," that "American medical schools, those bastions of left-brain muscle-flexing, continue their march toward whole mindedness." Pink also noted, "This [study] isn't about the artsy-fartsy or touchy-feely. It's about dollars and cents—and sometimes life and death."By improving inspection skills, the Training the Eye course improves the accuracy, timeliness, and cost-effectiveness of a diagnostic evaluation. As course coinstructor and museum educator Alexa Miller explained in the *Boston Globe*, "VTS offered medical

students a way to address ambiguous visual problems in art, thereby engaging visual, cognitive and communication skills." VTS helps this course meet its goal of improving medical student's skills and confidence in visual inspection—a simple procedure that practicing physicians must routinely provide (Kowalczyk).

Indeed, a number of medical schools have begun turning to art-viewing in search of ways to improve observation skills, as well as to stimulate dialogue and teamwork among colleagues and improve listening skills (Reilly, Ring, and Duke). For eight years, Weill Medical College at Cornell University has offered a noncredit art course in collaboration with the Frick Collection in New York City; on the West Coast, Stanford Medical School and the White Memorial Medical Center in Los Angeles offer such courses; and Yale and Mount Sinai medical schools now have required art observation courses (Kennedy).

FIG. 3.

Implications for Arts Learning and Partnerships With Schools

If it's good enough for doctors …

VTS is the most closely studied and evolved application of Housen's aesthetic stage theory in practice; the research has informed both the development and measurement of a teaching method and curriculum designed to support and accelerate aesthetic growth. Other applications of Housen's research abound. The Detroit Institute of Art and the Davis Museum and Cultural Center at Wellesley College have used the research to inform viewer-centered exhibition design, including the selection and arrangement of artworks, as well as all wall text and labels. As we reported here, medical schools are experimenting with applications of VTS, as are art history departments in colleges and universities, art departments looking for a way to make the critique process more fruitful, and even a law school professors looking to help students uncover the various arguments a piece of evidence might support in a trial. Although their use of VTS strategies has not been thoroughly studied yet, elementary and middle school teachers report applying VTS facilitation techniques to support the decoding of text; of charts, graphs and maps; of historical documents, photographs, and scientific phenomena.

For educators in the visual arts, VTS provides a natural bridge between arts-related goals of developing more astute, open, and confident viewers of art from many cultures, genres, and time periods to broader academic goals of developing good thinkers who can articulate their views, reason these with evidence, and broaden their thinking by considering the views of their classmates. In schools that do offer arts instruction, every opportunity for students to work with and shape their ideas in art materials is precious, as it is rarely more than a weekly opportunity. The VTS curriculum was designed for classroom teachers without any formal arts training to use with their students.

The curriculum asks teachers to lead 10 VTS discussions a year, provides a sequence of art images for each grade level K–5, and

training support to learn to lead VTS discussions. (A middle school adaptation of the curriculum is now also available.) VTS enlists classroom teachers as collaborators and active participants in supporting thoughtful art viewing within a school's overall visual art program. It can be a great partnership since VTS supports both aesthetic development and skills important to school success.

In school environments using VTS, arts teachers sometimes share responsibility with classroom teachers for conducting the discussions and more often use the VTS method to look at other works of art in class and in museums, and as a guide for critiques of student work—individually and in group discussions. (*What's going on your piece? What did you do to make me see/think that?*). Music teachers who have been trained in VTS report adapting the questions and discussion method to discussions of pieces of music, to stimulate active listening, and encourage students to articulate their thoughts and understandings about musical effects and meaning. *"What did you hear that makes you think that?"*

FIG. 4.

A recent article in *Edutopia* describes VTS as marking a "huge departure from the way schools and museums had always taught art." As Margaret Burchenal, curator of education and public programs at Boston's Isabella Stewart Gardner Museum and longtime supporter of VTS put it, "[We would] show kids *Starry Night* and feed them facts about Van Gogh. We spent so much time telling kids stories about art, in fact, that we were training them to be good listeners. It's as if you always read aloud to kids and never let them read on their own" (Smith).

As research mounts on the effectiveness of VTS as a learner-centered, developmentally based approach, increasing numbers of schools and museums are adding VTS to their complement of teaching tools. In the words of a teacher who recently introduced VTS to her first-grade class, "It's just like magic. It's an exciting way to get students talking, observing, making inferences and backing them up. And it's had a big effect on me as a teacher. I've gone from being the expert, the one who always has the knowledge, to being more of a facilitator" (Smith).

So, not only do students transfer thinking skills they learn in VTS discussions to other subject areas, teachers report (though this has not yet been formally studied) that they themselves transfer the VTS facilitating method to other areas of their teaching. This may be one of the most transformative aspects of VTS and art-viewing for any educator; the works of art and the method set the stage for an open-ended discussion where teachers can experience the shift from lecturing and leading in a right-or-wrong answer mode—to a mode of listening and facilitating—and allowing their students to do the hard work of reasoning, imagining, and interpreting.

For more information about VTS, including access to articles cited in this review, descriptions of the method, a video of students participating in VTS discussions, and opportunities to learn to use VTS, please visit http://www.visualthinkingstrategies.org or http://vue.org.

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