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The Art of Empathy: Visual Art Interpretation and Creation to Enhance Empathy in DPT Students

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Abstract
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The Art of Empathy: Visual Art Interpretation and Creation to Enhance Empathy in DPT Students

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ABSTRACT
Purpose: To pilot the inclusion of a visual arts unit grounded in social constructivist theory and framed around Visual Thinking Strategy into an entry-level anatomy course and explore its influence on enhancing empathy in Doctor of Physical Therapy students. Methods: 37 students enrolled in the second semester of an 8-semester program participated in this exploratory study using a mixed methods, pre-test, post-test design. Prior to and after the 3-week unit, students completed the Jefferson Scale of Empathy – Health Care Provider Student version (JSP-HPS). After the unit, students provided written reflections on their learning experiences. The JSP-HPS was assessed via paired t-tests. Reflections were considered using an interpretive phenomenological analysis (IPA); reflections were read and data points were coded for emergent themes, connections, and constructs. Results: JSP-HPS scores increased from 115.7 to 120.4 (p=.002) indicating enhanced empathy. Pluralistic intellectual humility (PIH) emerged as the primary construct from the reflections. PIH included 4 themes of 1) Ambiguity tolerance, 2) Self-discovery, 3) Empathy, and 4) Collaboration. Conclusions: Art interpretation and creation were effective in enhancing students’ empathy; however, empathy emerged as one aspect of the construct of PIH. Once the 4 themes emerged, we intentionally ordered them as potential building blocks. Enhancing empathy - the way to connect to the emotions and experiences of another person - is going to be challenging without addressing other aspects of PIH including ambiguity tolerance and self-awareness. Educators should consider the use of art interpretation and creation as a way to strengthen these critical characteristics.

Keywords: visual thinking strategy, pluralistic intellectual humility, health humanities
INTRODUCTION
The social constructivist approach to learning emphasizes the transformation of knowledge by the learner based on their past experiences and understanding, application of meaning to knowledge, and reflections on understanding throughout the learning process. This paradigm supports comprehensive learning as well as developing the growth of the student as a human being. In this approach, the student is central to the educational process and learning is focused on the acquisition of methodological and procedural skills that allow for and promote the learner building knowledge. The meaning of knowledge is constructed by the learner rather than passively received. When applied to health professions education, students can perceive themselves as future clinicians who are problem solvers constructing meaning about a patient's particular situation. Physical therapists seek to understand the human experience as they work with each patient to optimize movement and function within an individual's unique context, including their lived experiences, perceptions, attitudes, and beliefs. The way we see a person influences the way that we construct meaning about our observation. Best practice recommendations for clinical care support a biopsychosocial approach which requires providers to see patients within their individual contexts. However, as educators in a health professions program, we often ask students to deconstruct a human being into smaller units related to specific elements of the body by "thinking anatomically." 

Visual Thinking Strategy (VTS) is a pedagogical technique created and based on social constructivist learning theory. Questions are posed to a learner about an image in a way that requires them to pay attention to their way of discovering or constructing meaning while viewing visual art in a small heterogenous group of peers. The VTS protocol leads the group in a standardized series of 3 questions: What is going on here? What do you see that makes you say that? What more can you find? The intentional order of questioning prioritizes the construction of narrative with the first question, which is a common meaning-making strategy in novice observers. 

Empathy is "the ability to understand and share other people's feelings." Empathy is one characteristic that may influence a clinician's ability to construct an understanding of a patient's context. Several studies have demonstrated that higher levels of physician empathy are correlated with improved patient outcomes. Unfortunately, science-based medical professions students demonstrate a downward trend in empathy during their education. This decline might be due in part to the pedagogical approach. There is a tension/disconnect between current pedagogical strategies used to teach foundational anatomical content and healthcare educators' ultimate goal of producing excellent clinicians who are able to see the whole person. Current trends in healthcare education have encouraged the integration of humanities into the curricula as a means to develop empathy. A narrative review of art instruction in medical education has called for a more rigorous prospective assessment of course offerings of this nature. Di Lorenzo and colleagues further the importance of developing the emotional competence of all healthcare students "to specifically foster the development of these attitudes, which represent the first and indispensable step in implementing good clinical practice." The purpose of this research was to pilot the inclusion of a visual arts unit grounded in social constructivist learning and framed around VTS into a professional graduate-level anatomy course and explore its influence on strengthening observation and empathy in Doctor of Physical Therapy (DPT) students. This article only reports on the findings related to the impact of VTS on students' empathy; methods and findings related to observation components will be discussed in a future paper.

METHODS
Design:
This exploratory study used a mixed-methods, pre-test, post-test design. The study was identified as exempt from review by the University's IRB (H2003096). The activities in the unit were part of the required anatomy course; all students provided consent to complete the study assessment materials.

Participants:
Thirty-seven DPT students (28 female, 9 male; mean age 24) enrolled in a second-semester gross anatomy class participated in the study.

Description of Art Unit:
A three-week unit entitled, "How do we see a person?" was placed in the final 3-weeks of the second of a two-course gross anatomy series. The anatomy series is offered during the first two semesters of an 8-semester Doctor of Physical Therapy program. The class met twice a week for 2 hours at each session. The art unit included a total of 12 hours over 6 sessions. The first three sessions were synchronous, and the final three were asynchronous. Images were selected based on Amy Hermann's book, Visual Intelligence.
Sessions 1 and 2
Course instructors introduced famous works of art such as Edward Hopper’s 1927 painting, “Automat” (figure 1). Instructors adapted the VTS approach by reordering the first two standard questions based on Dekkers recommendation that initial observation in healthcare should be explicit in being objectively focused, rather than first focusing on personal narrative and meaning-making. Students responded to the questions:

1. “What do you see (in this image)?”
2. “What is going on and how does it make you feel?”
3. “What more can you find?”

Figure 1 Edward Hopper’s 1927 painting, “Automat”

Next, students were provided with a list of potential perceptual filters suggested by Amy Hermann that may influence their visual observations. Perceptual filters included consideration of past experiences, demographics, education, preferences, politics, beliefs, and social influences. Students became aware of their observations and perceptions and the meanings/conjectures they applied. Discussions about influences on their impressions of an image allowed for personal moments of awareness of bias. To reinforce objective observation, students were instructed in a formal structured process using Amy Hermann’s COBRA method. The COBRA stands for Concentrate on the camouflaged, One thing at a time, Take a break, and Realign your expectations. This instruction allowed students to use a structured process of observation and provided an opportunity to focus on describing what they were seeing. Using these 2 strategies (reflection on perceptual filters and COBRA), students differentiated between objective observation and conjecture.

Finally, students were shown images with “hidden pictures” (figure 2). These images were used to illustrate two concepts. Negative space is the space surrounding the main object of an image. Forced perspective is a technique that alters perception to make something appear different than it is in reality (taller, shorter, closer, farther). In this discussion, we drew parallels to healthcare in that the negative space may be those “unseen” aspects of patients’ life experiences, such as social determinants of health. Forced perspective could be analogous to patients’ perspectives about their healthcare experiences based on influences from family, social circles, or prior healthcare encounters.

Figure 2 Hidden Pictures
Session 3
Adapted from B. Edwards’, Drawing on the Right Side of the Brain, students considered the paradox between what is actually seen rather than what one expects to see. Techniques such as upside-down drawing and grid drawing support the exploration of these concepts. Students were provided the inverted picture of the man sitting in the chair (Figure 3) and a picture of a popular cartoon character with a grid overlay to reinforce the separation of objective viewing and perceptual meaning-making.

Figure 3. Drawing on the Right Side of the Brain

Sessions 4 and 5
Students were given class time to create their own visual art piece that answered the question, “How do we see a person?” Students could use a wide range of mediums to represent their unique perspective through artistic means, such as a 3-D model or a piece of visual art such as a painting, collage, or pen and ink drawing. Using a community discussion forum, students presented their art pieces with their answers to the prompt (How do we see a person) in a recorded video.

Session 6
Students watched the pre-recorded video presentations of their classmates’ art creations on the learning management platform (CANVAS) and posted a minimum of one comment on each peer video.

Data Collection
Quantitative
Researchers obtained permission to use The Jefferson Scale of Empathy – Health Care Provider Student version (JSE-HPS). The JSE-HPS was administered via Qualtrics prior to and after the unit. Dr. Mohammadreza Hojat developed versions of the Jefferson Scale of Empathy (JSE) to measure empathy in physicians and other health professionals and students in preparation for working in a clinical setting. A systematic review of psychometric assessment of the JSE reports that the survey demonstrates robust structural validity, internal consistency, and convergent validity; reliability measurement error and cross-cultural validity evidence is limited. Currently, minimal detectable change scores are not available.

Qualitative:
Post-unit reflection: Students were asked to reflect on the unit in a 1-2 page single-spaced paper. The prompt was “What, if anything, did you learn through the process of completing this project? How do you think this will impact your future role in the physical therapy profession? If you didn’t learn anything, why do you think that was the case?” Students uploaded their post-unit reflections onto the learning management platform (Canvas). For de-identification purposes, students used their ID numbers to complete the JSE-HPS and reflection.

Data Analysis
The JSE-HPS was analyzed using the Statistical Package for Social Sciences (SPSS Version 27). This survey consists of 20 questions scored from 1-7 (strongly disagree to strongly agree), with a higher score indicating higher empathy. Scores can range from 20 to 140. Surveys were assessed for completeness. Two surveys included one missing item and the missing values were replaced by the mean score for completed items as directed by the scoring algorithm. The 10 reverse-scored items were recoded, and the item scores were summed. Differences were assessed using a 2-tailed paired samples t-test, with a level of significance (alpha) of 0.05.
The students’ reflections were imported from Canvas to NVivo for an interpretive phenomenological analysis (IPA). IPA explores how participants are making sense of their personal and social world. This analysis is two-staged, or double hermeneutic; the participants are trying to make sense of their own experiences, and the researchers are seeking to understand their perceptions by getting close to their personal world. To further support trustworthiness, the researchers maintained a digital research journal through the NVivo software platform. The two researchers independently read the reflections multiple times and coded data points for emergent themes, connections, and constructs. As subsequent reflections were read and analyzed, researchers bracketed data and evolving analysis. Once all reflections were analyzed, patterns across the totality of reflections were considered to capture the shared experiences of participants. The researchers met on five occasions over a three-month period of time to discuss the data, seeking to understand the perspectives, contextual aspects of the narratives, and to refine themes. Consensus meetings culminated when the researchers agreed on the themes, their connections, a theoretical ordering, and primary construct. This systematic approach to data analysis ensured traceability of the development of themes and the resulting theoretical model.

RESULTS
The Jefferson Scale of Empathy – Health Care Provider Student
Data from thirty-one paired samples were considered. Six incomplete records were removed from analysis secondary to unmatched student ID numbers or not including the student ID number in either the pre-or-post administration. The empathy mean scores increased from 115.7 (SD 10.51) to 120.4 (SD 8.98). This change was significant, correlating with increased levels of empathy after the unit (p=.002; CI -7.55 to -1.93).

Reflections
Thirty-seven (37) reflections were assessed. A primary construct emerged from the reflections: pluralistic intellectual humility (PIH), defined as an accurate assessment of one’s abilities/achievements, an ability to acknowledge one’s mistakes, imperfections, gaps in knowledge, limitations, openness to new ideas, and an appreciation of input from others.

PIH included four themes of 1) Ambiguity tolerance, 2) Self-discovery, 3) Empathy, and 4) Collaboration. Once identified, refined, and defined, the themes were intentionally ordered as building blocks. Definitions of the themes and examples of narrative responses are provided.

Ambiguity Tolerance
This is the recognition that one’s own perspective is always going to be limited- acceptance of multiple possible meanings. Students’ comments identified both an awareness of its presence and stress in its absence. Ambiguity tolerance included the tenet of open-mindedness: the willingness to be open to new ways of doing, thinking, or being, of considering biases, context, and understanding with an openness to new ideas.

Honestly, I was nervous to begin this unit of art. made me nervous was trying to find ways to relate art to what we were doing in physical therapy. I lacked confidence that I would get there."

I desperately want everything to have an answer which is not a great mindset for a PT student to have when the answer will forever remain “it depends”. I think my own life experiences made me this way. I grew up in a family of four kids and took on the role of being dependable and predictable in a way. Perhaps this fed into my desire for the world to be predictable. Something it will most likely never be.

This unit also taught me to just practice flexible thinking and to be intentional about it.

Self-Discovery
This is the process of acquiring insights into one’s own character values, and captured growth towards self-awareness. Students’ responses identified an opportunity to reconcile self-concept with peer feedback, awareness of personal strengths and weaknesses, and identity formation.

This project reminded me to trust the process. During the entire process of creating the concept and content for my project, I found myself thinking that my idea and perspective was not "good enough" and that it did not make sense. Looking at the responses of my peers exposes the faults in my thought process. Their reactions showed me that we, as future physical therapists, also need to answer the question, "How do you see yourself?"

I (also) learned that I am much more creative than I previously thought. My artistic abilities, on one hand, are atrocious, but my mind’s ability to come up with abstract concepts is more developed.
Realizing that I could create an art piece that looked good, like I wanted it to, and had meaning behind it, really changed the way I viewed myself. It almost changed my identity, I was always the “good at sports but bad at art kid,” but now I cannot say that anymore. I am still terrible at drawing and painting, but that does not mean I am bad at art, which is so cool.

Empathy
Empathy is a way to connect to the emotions and experiences of another person. Students reflected on tendencies to avoid empathy and the influence of empathy on developing relationships with others.

I also realized that I do not always try to see everyone, especially the people that go unseen like the mentally ill or homeless. It is not because I think they are bad people, it is because seeing them, really looking at them and trying to understand, makes me so sad that it is simply easier to pretend to not see them...I noticed in myself the people I choose NOT to see, I do this by not looking at them directly in their eyes because if I could see the anguish, sadness, anger, and loneliness that might behind those eyes, I do not know how well I would recover.

It is interesting to think that I could have experienced my entire graduate education and never explicitly contemplated how I saw a person. As I was brainstorming for the project, I thought of the many instances in which I chose not to see someone and feel compelled to do and be better.

It felt like an honor to get to learn about my classmates in such a personal way and really appreciate the new connections that I have made through doing this project. My classmates impressed me with their willingness to be vulnerable and express how they see a person, how they feel people see them, and the impact that our perspectives have on relationships. Personally, it felt like we were breaking through some areas, shining some light on personalities and opening the doors to better friendships and lasting connection.

To always (take) taking the time to make sure I truly am seeing the person in front of me and seeking to understand their pain from all perspectives instead of how I think they should be feeling. I do not want to project my own perceived biases and perceptions onto their situation and assume I know exactly what they feel or are facing.

Collaboration
Collaboration means valuing the contributions of others. Students expressed gratitude for the uniqueness of individual meaning-making and the enrichment provided by the shared perspectives of others.

It taught me to welcome a different perspective any time one is available because everyone has something unique to contribute based on their own personal journeys, pasts, and experiences.

Just to be able to hear about everyone’s process and perspectives was inspiring and insightful because I gained something different from each presentation. It showed me how appreciative I am of people’s differences because if we had all come up with same thing it would have been so boring.

This brought into focus just how many different ways there are to see a person and that none of our interpretations were wrong. Watching the videos of those classmates presenting their art and their unique view reminded me of the importance of collaborative reasoning.

DISCUSSION
The implementation of a visual arts unit grounded in social constructivist learning and framed around VTS into a professional graduate-level anatomy course demonstrated increased empathy in DPT students. Quantitatively, empathy scores increased from the pre-unit to post-unit testing, supporting the initial hypothesis. Qualitatively, complexities became evident as four themes emerged (ambiguity tolerance, self-discovery, empathy, and collaboration) from the reflections. As we considered the themes and the students’ comments, a developmental process became apparent, which we considered building blocks. We intentionally ordered them in a manner that began with a base of ambiguity tolerance, followed by self-discovery, empathy, and collaboration.

Beginning with the foundation of ambiguity tolerance, we were surprised by the vast number of comments related to a lack of this, as evidenced by challenges with being open-minded, and fear of situations with multiple answers. The education of healthcare providers may strive to reduce uncertainty in searching for a specific correct diagnosis. However, this process may reduce the tolerance for ambiguity, which is the hallmark of deliberate practice. Ambiguity tolerance promotes more flexible diagnostic
capability in conditions of complexity, novelty, and uncertainty. Clinicians with ambiguity tolerance tend to value heuristics and scientific objectivity while also being more likely to collaborate with others to make a judgment. Through art, Baumann argues that “ambiguity, when recognized as a multidimensional capturing of a lived experience, can provoke further inquiry.” Tolerance of ambiguity is essential to be curious, learn, and grow.

Related to the next building block of self-discovery, students were surprised to realize that this project facilitated learning about themselves. They described self-characteristics that were previously unknown or had been forgotten over time. Their discoveries related to the process of introspection and reflection as well as receiving feedback from their peers. In this manner, self-discovery from this project supports the development of self-awareness as defined by Carden, Jones, and Passmore: “Self-awareness consists of a range of components, which can be developed through focus, evaluation, and feedback, and provides an individual with an awareness of their internal state (emotions, cognitions, physiological responses), that drives their behaviors (beliefs, values, and motivations) and an awareness of how this impacts and influences others.”

Many comments about self-discovery focused on their abilities to be creative. It is possible that these particular findings can be attributed to the embodied learning methods (learning by doing) that are unique to this project. Many similar projects that integrate humanities into health provider education incorporate the visual aspects of the project through visiting a museum or discussing famous works of art. Creating a visual art piece that was meaningful to the student added another layer of learning. Students proved to themselves, despite their previous beliefs, that they could employ creative thinking.

Empathy emerged as one aspect of the construct of pluralistic intellectual humility. The students’ reflections that demonstrated the theme of empathy were often fear-based. Students noted a tendency to circumvent feeling empathy for others in many situations as a self-protective mechanism to avoid pain or sadness. This is an important finding as future healthcare providers will frequently interact with patients experiencing pain and dealing with loss. The building block nature of these themes would suggest that without well-developed self-awareness, emotional regulation, and boundaries, empathy may not be able to exist in a relationship. The students feared empathy because they could not handle the sadness, anguish, or loneliness that may exist if they chose to engage with empathy. Contrastingly, empathy was seen as an essential component of creating stronger connections with others. Those who were able to open themselves to feelings of empathy for their classmates expressed gratitude and deeper interpersonal connections.

The final block, collaboration, is accessible once a person is open-minded to alternative perspectives, aware of their own perspectives and their limitations, and can empathize with people different from themselves. At that point, a person can genuinely appreciate, value, and learn from collaboration with others.

CONCLUSION

Art interpretation and creation was effective in enhancing students’ empathy; however, empathy emerged as one aspect of the construct of pluralistic intellectual humility. We posit that developing empathy - the way to connect to the emotions and experiences of another person - is going to be challenging without first addressing students’ ambiguity intolerance and limits of self-awareness. Given that research demonstrates a typical downward trend in empathy of students in science-based medical education programs, we wonder if this is because of deficits or areas for needed personal growth in some of these other aspects of pluralistic intellectual humility. As educators, we should create safe spaces for students to contemplate ambiguous topics, consider their individual perspectives, become aware of their perceptual filters, and engage in collaborative discussions with their peers. Reflection on visual art and art creation provides a platform for these conversations.
REFERENCES


