

Art and Medicine: from anatomic studies to Visual Thinking Strategies

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Article history

Received: June 14, 2015

Accepted: June 23, 2015

Published: June 30, 2015

Abstract

Over the centuries the collaboration between artists and doctors and the relationship between art and medicine disciplines have been documented. Since the '60s the discipline of medical humanities has been developed in order to enrich the studies in medical sciences with the humanities. In the belief that medicine is more than just a set of knowledge and technical skills, medical educators have considered important to include the humanities as art, literature, philosophy, ethics, history, in the curriculum of training a good doctor. Despite there are examples of previous use of art as part of the curricula of medicine as a tool to develop the cognitive skills of observation and description, there is a general consensus that the semiotic competence starts from a correct and deep observation, "clinical eye", using senses to diagnose disease. It can talk about "Visual Thinking Strategy" (VTS) in this context. The VTS provides a way to enable the observation of the work of art, the process of analysis, comparison and discussion with others that allows the medical student to acquire a method to be applied also in clinical activity, improving skills in patient examination, by implementing the problem solving and critical thinking, getting used to teamwork, stimulating empathy toward patient and respect for others (whether patient or colleague). The observation practice should be key thing for medical training and this theory can be an aid to improve clinical skills. A trial of VTS for medicine students connected to Semiotic Course in collaboration with the Galleria Borghese in Rome during last academic year was carried out at The Degree Course in Medicine of the Faculty of Medicine and Psychology of Sapienza University.

Keywords: Medical humanities, art, Visual Thinking Strategies

Introduction

Art understood as 'Tèchne' could be described as the application of rules set and experiences elaborated by man, therefore the knowledge, in order to make objects or to depict images taken from reality or fantasy world. Medical Science is a discipline defined as Art in so far as it able to apply the knowledge, therefore the Science of the disease cure. Over the centuries these disciplines have developed many relationships, in fact, we have document of the cooperation between artists and doctors. Let's think , in Classical Antiquity, when artists could learn anatomical features only through the observation of athletes in gymnasium. Anatomical features, still unknown to the doctors, who could not use, for example, the dissection of

corpse because this practice was prohibited for religious reasons. They were able to "admire" the representation of muscles stretching through sculpture, an example is Myron's Discobolus.

In Medicine field only Herophilus of Chalcedon and Erasistratus, in the third century B.C. carried out dissections of "live" human bodies (1) until 1241 when Federico II promulgated the edict that authorized and stimulated the use of cadavers by doctors. In 1316 Mondino de Liuzzi wrote "Anothomia" founding the first School of Human Anatomy in Europe.

It will have to wait the Renaissance, with the birth of the "modern" medicine, to discover that also the artists were able to use the human bodies for their anatomical studies. The first known example was Il Pollaiuolo

(Antonio Benci), whose anatomical drawings are at Louvre (2). In this period the collaboration between doctors and artists is very fervent, just refer to the Treaty of Anatomy wrote by Andrea Vesalio "De humani corporis fabrica libri septem" (1543), with its 300 anatomical woodcuts illustrated by the Flemish engraver and painter Jan Stephan van Calcar (3). Needless to mention the Leonardo Da Vinci's drawings with his anatomical studies, the descriptions for dissecting cadavers or Raphael's drawings, and the studies for the composition of the Deposizione Borghese (1507), which documents the artist's practice and anatomical knowledge.

The Art has "borrowed" techniques from the medical practice to depict the human figure and it has also documented the medical art as It is highlighted by the numerous paintings illustrating anatomy lectures, as An anatomy lecture for artists (ca. 1570), Michelangelo surrounded by other artists showing the Sartorius muscle of the dead body, by Federico Zuccari or the Anatomical lecture of Dr. Willem van der Meer (1617) by Michiel and Pieter van Miereveld or the Anatomy class of Dr. Nicolaes Tulp (1632) by Rembrandt van Rijn.

In this brief description of the relationship between artists and doctors it is necessary to cite the anatomical wax modeling. During the Renaissance takes place the true rediscovery of the human body; artists and doctors study the cadavers, encouraged by a strong scientific interest in anatomy, and it is during this early stage of research that wax, as material, plays a key role, especially in the work of the artists. This practice was used in anatomical research as an expressive and a figurative vehicle, and there were many artists who used preparatory small-scale wax models for their artworks. Ludovico Cardi, called Cigoli used this technique to better represent the human body and an example is *Lo Scorticato* (1678). The flemish Dr. Maiering helped him for the anatomical investigation.

In the 1700s the anatomical wax modeling was developed by the collaboration between Gaetano Giulio Zumbo, a sicilian wax modeler, and the French surgeon Guillaume Desnoues. Anatomical artifacts were produced to train the doctors but their extreme realism and the representation of the dramatic death appearance let them to be considered true art works.

The evidence of diseases in figurative artworks (painting, sculpture and so on) is another topic that connect Art and Medical disciplines. Indeed many doctors were able through the observation of the representation of the human figure by artists, to trace the presence of some diseases that today, fortunately, have been eradicated such as the plague. It is interesting to report what Dr. Giovanni Franceschini wrote in 1906 " anche i lati più tristi e dolorosi della vita umana, così piena di sofferenze fisiche, siano stati, in quasi tutti i tempi, soggetto di studio da parte di artisti preclari, e come anche le scienze più pietose e ributtanti della

medicina abbiano strappato al pennello creatore dell'artefice appassionato opere palpitanti di vita, di verità, di sentimento. E poichè il bello è lo splendore del vero, si può dire che anche le più crude verità della patologia umana rivestite degli splendori dell'arte da una mano sapiente di artefice, hanno contribuito alla creazione del bello, con opere sublimi di pittura e di scultura" (4).

The artists work makes them excellent observers. They capture every small detail of the figure's body represented, also by recording the physical conditions of their models. This is reason because doctors to describe the disease of the models in the past paintings such as the diagnosis of scoliosis in the woman behind of the Three Graces (1639) by Peter Paul Rubens (5), through careful observation of details.



This practice has developed a debate on effective of clinic diagnosis of the patients who can no longer be cared for, and on the 'Iconodiagnostica', practice introduced in Italy by the pathologist, Professor Vittorio Franco, that attracted criticism by some art historian. But one of the results presented by Franco, and those of a spanish colleague about the Gioconda's case may create curiosity about this discipline.

Franco, has analyzed about one hundred art works and He had been able to find that, probably, the Mona Lisa had a xanthelasma under his left eye, Hypercholesterolemia mark, and a Lipoma on hand. The Spanish Dr. Francisco Javier Barbado Hernandez studying the Mona Lisa of the Prado (1503-1506) by Leonardo's pupils work, found on the hand not a lipoma mark, but sign of a bloodletting. The art historian Carla Gori comparing evidences by the analysis of Dr. Barbado

Hernandez and letter by ducal official Giacomo Seregno dated August 2, 1496 "sappiamo che la primogenita del Moro, da mesi sottoposta alle cure dell'archiatra e astrologo Ambrogio da Rosate per una malattia misteriosa, forse da avvelenamento, in quella data rifiutava il salasso", has deduced that the Mona Lisa could represent a portrait of Bianca Sforza (6).

Interesting pathognomic signs by artworks it can see in Galleria Borghese, for example the self-portrait by Gian Lorenzo Bernini. The doctor of our research team has suggested evidence of alopecia areata.

In recent years, Art has a social role in the care centre, and the Art therapy is used as a support of psychology care.

Art plays an important role in learning, and visual thinking since Arnheim, is useful tool for improving knowledge. Debate on the museum roles and relevance of the art works in contemporary society in education and training environment is ongoing so it is possible to talk about Visual Thinking Strategy. The observation practice should be key thing for medical training and this theory can be an aid to improve clinical skills (7).

Visual Thinking Strategy (VTS)

In the mid-70s, in the United States, Abigail Housen, a cognitive psychologist, daughter of a psychologist and an Art Historian, introduced a study based on the behavior of museum visitors focused on the thoughts that are stimulated by artwork observation.

Housen, through an indirect interview, invites the museum visitors to tell what they see in the artwork and the thoughts that this excite them. The questions are open and they don't affect the viewer. During this time this survey, called Aesthetic Development Interviews (ADI), allows Housen to collect a large sample of data and to have an idea of people's thoughts in front of an artwork (8).

The intellect develops thoughts and judgments by emotions and feelings which lead to subjective interpretation when the viewer is placed in front of art.

Housen realized immediately that there is a wide difference in the analysis ability between an observer accustomed to look at artwork and another observer that is not. The long-lasting relationship with art allows people to develop meaningful changes in thinking. The Art is able to arouse thought complexity also for viewer less accustomed to art (9).

Results of this study and other researches on this theme allow Housen to start to define a teaching strategy entirely based on the power of visual communication and to debug the method of the Visual Thinking Strategy, to help concretely students in learning and in getting analysis skill.

Housen's method is connected strictly to Rudolf Arnheim's research that convincingly explains the connection between visual perception and thought. Identify what we see, according to Arnheim, is knowledge action. When it looks at something, the mechanisms of understanding take place quickly to recognize and grasp the meaning of what is being put before eyes. Moreover, thanks to visual stimulus, thoughts and acts to solve problems are automatically set (10). So Visual Thinking Strategies teaching can be applied for developing critical thinking (11).

The practice of VTS method called students to look at and to interpret an art work. A Guide, expert in VTS, brings students in environment characterized by constructive dialogue and encourages them to use the individual abilities of observation, reflection, and to explain and compare their ideas with others.

A key element of VTS teaching is to encourage students to present and explain the evidences of details identified in artwork observed. This cognitive challenge encourages students to rely on their skills and knowledge, thereby increasing self-confidence to expose their thoughts and conclusions.

VTS improves skills that becoming mental processes repeatable, more or less knowingly, every time that it is activated learning mechanism. The VTS can be useful in all education or training subjects and for all students (12). The studies on the VTS impact argue that in addition to the growth of aesthetic understanding, is supported the increase of critical thinking skills and creativity that can be easily transferred to other subject areas. Furthermore the use of visual language highly helps profit and integration of disadvantaged students for social, physical or linguistic issues (13).

VTS and medicine

Since the '60s Medical Humanities has been developed to meet need to enrich the studies in medical sciences with the humanities (14). In the belief that medicine is more than just a set of knowledge and technical skills, medical educators have considered important to include the humanities as art, literature, philosophy, ethics, history, in the curriculum of training a good doctor. In recent decades, in medicine field, there were advances in research related to instrumental and laboratory tests, resulting a better efficacy in the diagnosis and treatment. However, there was an increase in costs for the use of these instruments, often unnecessary, with result to have congested laboratories and increase false positive results. A good Semiotic helps doctors to select few very specific test to accurate diagnosis. So it is necessary to improve this subject education in medical school. There is a general agreement that Semiotics starts from a correct and

thorough observation, in fact it talks about "clinical eye" to indicate semiotic competence related to use of senses to diagnose disease (15).

Despite there are examples of previous use of art as part of medicine curricula and as a tool to develop the cognitive skills of observation and description (16), "Visual Thinking Strategy" by Housen was applied for the first time in a degree course in medicine and surgery at the Harvard University in the academic year 2003-2004 for the students of the 3rd year, with a 9-week elective course entitled Training the eye (17). The course was held at the Museum of Fine Arts in Boston and at University with clinical lectures, both in the classroom and in the aisle, where teachers bring medical attention to the visual diagnosis for connecting between the physical examination and artistic concepts.

At the museum the students perform observation, description, and creative collaboration of the meaning working in pairs, directly with original artwork. In the final session, medical director of the course interview and examine a patient with a complex disease with the active involvement of students (18).

Afterwards, this strategy has been adopted by other US universities as Ohio in collaboration with the Art Museum of Colombo, in Art of Analysis elective course, involving students of the 5th year of medicine starting from the academic year 2010-2011. Starting from Housen VTS, it was designed a critical thinking form to guide the analysis of the works, called ODIP, an acronym of "to Observe, to Describe, to Interpret, to Prove" (19).

In academic year 2014-2015 also the Dallas department of dermatology and the Art museum of the city have held course "Art of observation" applied VTS. The students, divided into small discussion groups, are placed in front of artworks and Tutor as facilitator guides them to bring their attention on observation and description and discuss together (20).

References

- Mingazzini, P., Leonardo e l'anatomia in IL BASSINI, 30(1), 2010, pp. 62-74.
- Joconde Database http://www.culture.gouv.fr/public/mistral/joconde_fr?ACTION=CHERCHER&FIELD_3=AUTR&VALUE_3=POLLAIUOLO%20ANTONIO%20ODI.
- Vesalio, A., De humani corporis fabrica <http://archive.nlm.nih.gov/proj/flash/vesalius/vesalius.html>.
- Franceschini, G., La patologia umana nell'arte in Emporium rivista mensile illustrata d'arte - letteratura - scienze e varietà, vol. XXIV, n. 144, dicembre 1906.
- Ge, S. Mengxiao. "Observation: The Importance of Art in Medicine." (2013) http://aoc.mcgill.ca/library/files/library/susan_ge_art_medicine.pdf.
- <http://www.archeomatica.it/Ultime/la-gioconda-del-prado-rafforza-l-ipotesi-di-bianca-sforza>.
- Familiari, G., Ziparo, V., Relucenti M., De Biase, L. Gallo, P., Frati, L., Arti figurative e Formazione in

Conclusion and perspective

The relationships between art and medicine, as we have seen before, are many. The relationships between art and medicine, as we have seen before, are many. A detailed observation of the context, the narrative and emotional dimension of person are key roles in both disciplines. Art, through the activities of observation, analysis, comparison and discussion given from the VTS tools, allows the medical students to gain a method that can be applied in clinical practice. They can improve the skills related to physical examination of patient, problem solving and critical thinking, getting them used to teamwork, cultivate empathy toward patient and respect for others (whether patient or colleague) (21).

The VTS is applied both in school and in academic environment, also in the care field in USA. In Europe and especially in Italy, there aren't still such experiences, although in medicine degree are becoming more frequent the elective activities related to art, literature, music and so on. In academic year 2014-2015 at the Medicine Degree Course of the Faculty of Medicine and Psychology at "La Sapienza" University, application of Visual Thinking Strategy has been experimenting in an integrated course in scientific-methodology and human sciences. "Art of observation: from artwork to diagnosis" course has been held as VTS application for medicine students of the 3th year in collaboration with the "Galleria Borghese" in Rome. The VTS is a useful tool for the development of critical thinking, suitable to stimulate the sensitivity to art and to improve awareness of the cultural heritage. In order to strengthen evidences on VTS impact on semiotics learning, participants to the course will be tested at the end of this experiment. If results will be promising VTS will be proposed in different learning environments and as supplement in museum educational activities.

- Medicina. Potenzialità e prospettive in *MEDICINA E CHIRURGIA* (ISSN:2279-7068), 2010, 2143- 2150.
8. Housen A., Aesthetic thought, critical thinking and transfer in *Arts in Learning Journal*, 18(1), 2002, 99-132
 9. Housen A., *Eye of the Beholder: Research, Theory and Practice*. 1999, <http://www.vtshome.org/system/resources/W1siZiIsIjIwMTIvMDQvMjYvMDI0fMTFfMDVfODM3X0V5ZW9mdGhlQmVob2xkZXIucGRmIl1d/EyeoftheBeholder.pdf>
 10. Arnheim R., *Visual Thinking*, University of California Press, Berkeley-Los Angeles, 1969; trad. it. *Il pensiero visivo*, Einaudi, Torino, 1974
 11. *Visual Thinking Strategy Website* <http://www.vtshome.org/>
 12. *Visual Thinking Strategies, Research Major Findings* - <https://apopheniainc.wordpress.com/page/27/>
 13. Lampert, N., Critical thinking dispositions as an outcome of art education. *Studies in Art Education*, 47(3), 2006, pp. 215-228.
 14. Polianski, I. J., & Fangerau, H. Toward “harder” medical humanities: Moving beyond the “two cultures” dichotomy. In *Academic Medicine*, 87(1), 2012, pp. 121-126.
 15. Toro-Huamanchumo CJ, Aree-Villabos LR. The clinical eye: a need to improve the teaching of semiology in undergraduate medical education in *t J Med Students*. 2014 Jul-Oct; 2(3):144-5.
 16. Braverman I.M. To see or not to see: How visual training can improve observational skills. *Clinics in Dermatology* 29,2011, pp. 343-346.
 17. Shapiro, J., Rucker, L., & Beck, J. Training the clinical eye and mind: using the arts to develop medical students' observational and pattern recognition skills in *Medical Education*, 40(3), 2006, pp. 263-268.
 18. Katz and, J. T., Khoshbin S., Can visual arts training improve physician performance? In *Trans Am Clin Climatol Assoc*. 2014; 125:331-342
 19. Jacques A., Trinkley R, Stone, L., Tang R., Hudson W., Khandelwal S., *Art of analysis: a cooperative program between a museum and medicine* in *Journal for Learning through the Arts*, 8(1) 2012.
 20. *Course of Art of observation-MED-1039* <http://utsouthwestern.mrooms3.net/pluginfile.php/45052/course/summary/Art%20of%20Observation.pdf>
 21. Reilly JM, Ring J, Duke L. *Visual Thinking Strategies: A new role for art in medical education*. *Fam Med*.2005;37:250–2.