

Article

Virtual Visual Thinking Strategies: limitations and unexpected findings in a time of pandemic

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Abstract

Colleges and Universities across the United States are seeking to instill general education competencies. Visual Thinking Strategies (VTS), an inquiry-based methodology developed by Paul Yenawine and Abigail Housen, has been shown to in qualitative studies to promote such skills. This research project sought to explore whether utilizing VTS in an undergraduate classroom could improve students' attainment of general education competencies, as measured by the VTSkill Rubric. We conducted a research experiment with 27 U.S. undergraduate students in Spring 2021; due to the COVID-19 pandemic, the students' learning experience and the research experiment took place fully online. We did not find the expected significant improvements in critical thinking, observation skills, but only in linguistic expression, and problem solving. Future directions for research include replicating the study in person, altering the methodology, as well as developing new research projects to more thoroughly examine the most beneficial applications of VTS for college students.

Keywords: Skills, Visual art, Visual Thinking Strategies, Learning, Assessment

Introduction

Colleges and Universities across the United States are seeking to instill General Education competencies among their undergraduate student populations. While requirements vary across institutions, critical thinking, problem solving, and oral and written communication are the skills broadly conceived to be essential to an undergraduate education (Middaugh 2010). While visual and performing arts account for under 5% of Bachelor's degrees awarded each year in the United States (National Center for Education Statistics 2021), the arts can serve as a valuable tool for teaching general education competencies to students of all majors. Visual Thinking Strategies, an inquiry-based methodology developed by Paul Yenawine and Abigail Housen, promotes skills of observation, analysis, and interpersonal communication (Yenawine 2013).

VTS curriculum is frequently implemented in the American K-12 educational system with positive results of improving a range of developmental skills among students (Franco and Unrath, 2014). In a VTS session, participants are invited to closely examine a work of art as a group, before being asked a sequence of open-ended yet precise questions by a facilitator. The questions – “What’s going on in this picture?,” “What do you see that makes you say that?,” and “What more can we find?,” – are phrased in order to promote deep, patient observation, evidenced-based analysis, and narrative meaning-making (Hailey, Miller, & Yenawine 2015). Following a response from members of the group, the facilitator provides feedback by paraphrasing the comments made by each viewer-participant and building links between such remarks, without judgment or evaluation of whether the comment is “correct.”

Studies have shown that participating in this specific format of interaction and engagement with a work of art improves communication skills and builds a sense of mental clarity, confidence, and curiosity (Yenawine, 2013). Research demonstrates that VTS can also enhance visual literacy, pattern recognition, verbal and listening facilities, tolerance for ambiguity and uncertainty, and cultural openness (Childress and Chen 2015). VTS has been shown to improve linguistic expression and analysis, as students “learn more quickly, have greater comprehension skills, and are more capable of expressing whole concepts and completing whole thoughts in a sentence” (Landorf 2006, p. 30). The method has also been used extensively in medical education to enhance analytical, observational, and inference abilities among current and future healthcare professionals (De Santis et al. 2016; Perry et al. 2011).

The benefits of participating with VTS described above align well with the skills and values that are part of most contemporary General Education programs in American institutions of higher learning. The concept of a “general education” curriculum dates to the nineteenth century, and rose to prominence as a clearly defined, foundational and required component of the undergraduate experience in the United States in the 1960s (O’Banion 2016). Nationwide, efforts to modernize general education curriculum by making it more outcome-oriented have taken place in the past decade (Schejbal 2017). For example, “Enhanced General Education” competencies adopted by the University of South Florida in 2018 seek “to help prepare students for the new global and technological realities of the 21st century” by enhancing “students’ skills in the following critical skill domains: critical and analytical thinking, problem solving, and communication” (University of South Florida 2018). In order to evaluate whether VTS could aid undergraduates at the University of South Florida in attaining these skills, an evaluation tool was necessary. The VTSkill Rubric was selected,

because it explicitly measures the same competencies: critical thinking, observation skill, linguistic expression, and problem solving. The VTSkill Rubric has been validated as a quantitative measurement tool in an Italian educational context, but not in the United States (Ferrara et al. 2020). This study would assist in further validating the VTSkill Rubric by testing it in a different cultural and educational environment.

Methodology

Research participants are 27 undergraduate students in the Judy Genshaft Honors College of the University of South Florida. The students are diverse ethnically, linguistically, and in terms of their academic experiences and interests. For several students in the cohort, English is a second language; Spanish, Arabic, and Punjabi represent the primary language of several of the study's participants. The students represent a wide range of academic majors - from Public Health to Music Studies, Psychology to Cell and Molecular Biology - and are in their second, third, or fourth year of undergraduate study. The unifying characteristic of the research participants is enrollment in a one-semester Honors capstone course that explores the relationship between art and mental health and trains students to facilitate therapeutic interactions with art at a local museum.

Research was conducted with two separate cohorts during Spring 2021. Each cohort met once per week for a three-hour virtual session via Zoom over the course of a 15-week semester. Typically, for the first hour of each meeting, students discuss assigned readings representing peer-reviewed research from fields including psychology, art history, medicine, art therapy, and educational pedagogy. These readings provided the essential foundational content and theory that informed the experiential learning taking place later in the class period. For the remainder of each class period, students learn about the art in the museum's collection, experience expert facilitation of activities derived from the methods of art engagement that they have read about and discussed, and practice facilitating these methods in preparation for returning to the museum as volunteer docents. The faculty and the museum's Curator of Education developed half a dozen gallery activities suitable for different museum visitor groups with a range of cognitive and physical abilities by adapting two main modes of active engagement with art - Visual Thinking Strategies (VTS) and Personal Response - while retaining the core principles of these two methods: asking open-ended questions, paraphrasing the response, and listening actively without judgment.

As part of the course curriculum, students in the research cohort view and discuss artworks via Zoom using the prescribed methodology of VTS during eight class meetings over the course of the 15-week semester. While the number of artworks explored and amount of time spent participating in VTS discussion varies somewhat by session, the eight virtual experiences with VTS on average each feature three artworks and discussion lasting approximately 60 minutes. Following their first virtual VTS session, students were given a homework assignment asking them to reflect on their expectations for the course ahead. Then in the assignment prompt, they were provided with an image of an artwork they had not previously viewed and were given a writing prompt based on the VTS questions - "What is going on in this picture?" and "What do you see that makes you say that?" The artwork was Henry Wallis' *Death of Chatterton* (1856). The same prompt was provided for the same

artwork at the end of the implementation period, following a request to reflect on the semester’s course experience. An assessment of students’ abilities to observe, communicate details, and interpret artwork was analyzed by employing an assessment rubric (VTSkill) of skills.

Students were provided with an informed consent form following the completion of their post-course written reflection and had the option to have their written reflection included or excluded as part of our sample. Students who opted-in to the study had their writing about the Death of Chatterton independently analyzed by two research members utilizing the VTSkill rubric. The two researchers scored three writing samples together to ensure consistency in application of the rubric, then scored the remainder of the writing samples separately, ensuring interrater reliability. Student scores were tabulated and graphed to illustrate results.

Evaluation and analysis

The pre- and post-course writing produced by the students as a response to the VTS questions about The Death of Chatterton was assessed using the VTSkill Grid rubric, with scores assigned for Critical Thinking, Observation Skill, Linguistic Expression, and Problem Solving. The result of the analysis is presented in Table 1, with the average of the scores for each student achieved across all competencies represented in the results column. Out of the 27 participants, only 12 achieved improvement in their overall competencies ≥ 0 , while 15 were negative.

A more detailed analysis does reveal some positive trends (see table 2). 21 of 27 participants achieved a result ≥ 0 for Linguistic Expression, while 19 students demonstrated an improvement or maintenance of Problem-Solving abilities (≥ 0 for 19 students). Critical thinking and observation skills were the areas in which the least improvement was seen, with only 5 and 9 students, respectively, demonstrating results ≥ 0 . While overall there are some indicators that students were able to maintain and develop General Education competencies over the course of the semester, the average does not demonstrate an entirely positive impact of the experimental teaching methodology.

student	Critical Thinking		Observation Skill		Linguistic expression		Number of Word		Problem solving		Elements identified		Results
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	post	
1	2	1	2	1	2	2	91	118	2	1	7	5	-3
2	3	4	2	3	3	4	125	207	2	3	8	10	4
3	4	3	3	3	4	4	194	431	4	4	6	8	-1
4	4	4	3	2	3	2	289	185	4	3	7	5	-3
5	3	2	3	1	2	2	174	126	2	2	8	4	-3
6	2	2	2	3	2	3	77	109	2	2	6	4	2

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7	2	1	1	1	2	1	134	70	1	0	3	0	-3
8	3	3	3	4	3	4	159	206	3	3	8	8	2
9	3	1	3	3	1	3	127	225	2	1	6	7	-1
10	4	4	3	3	4	2	263	207	3	2	12	4	-3
11	3	3	3	4	4	4	238	331	3	3	10	7	5
12	2	3	2	3	2	3	126	191	2	3	9	6	4
13	3	3	4	4	3	3	362	430	2	3	16	12	1
14	1	2	2	2	3	2	139	197	1	2	9	8	1
15	3	2	3	1	4	2	213	116	3	0	9	2	-8
16	3	3	3	2	3	3	360	215	3	3	12	5	-1
17	3	3	2	3	3	3	155	117	2	2	8	7	1
18	4	3	3	3	3	3	194	162	3	3	9	6	-1
19	3	3	2	1	3	3	303	181	2	2	8	5	-1
20	2	3	1	4	2	3	288	417	2	4	11	8	7
21	3	3	3	3	2	2	170	113	3	2	6	5	-1
22	2	3	3	4	2	4	228	287	2	4	8	8	6
23	4	3	3	4	3	3	191	144	3	3	7	6	0
24	3	4	2	3	3	4	125	244	2	3	6	6	4
25	1	1	4	4	3	3	278	447	2	1	13	16	-1
26	3	3	2	1	3	3	179	155	2	2	9	9	-1
27	4	3	4	4	4	4	183	175	3	3	12	10	-1

Table 1 – Evaluation of Individual Participants using the VTSkill Grid

Number of students with results ≥ 0 for impact of all skills	12
Number of students with negative impact of all skills	15
Number of students with ≥ 0 for improve linguistic expression	21
Number of students with ≥ 0 for improve observation skills	9
Number of students with ≥ 0 for improve critical thinking	5
Number of students with ≥ 0 for improve problem solving	19

Table 2 – Data analysis sorted by skill type

Discussion and conclusion

Significant improvements in all the areas measured by the VTSkill rubric was expected but not observed. The timing of the writing prompts may have been a factor in these results. The initial writing prompt was given following the first class period, during which students had participated in one VTS session that included discussion of three images. Other research using qualitative methods or observational studies have proposed an improvement in communication abilities (Moorman 2015) and interpretation (Jasani and Saks 2013) following a single VTS session. This suggests that a relatively small number of VTS sessions can be effective at creating capacities for observation, communication, and interpretation. It is possible that this experimental group's single VTS session was sufficient to build their observation, communication, and interpretation skills to a moderate level, and that subsequent VTS conversations did not further elevate these abilities. This could be tested in the future by assigning a writing prompt before any VTS conversations take place, then again at intervals of 2 weeks to determine a more accurate timeline for skill improvement and whether there is a "leveling off" of abilities.

The timing of the final writing prompt may also have been a factor in student performance. Participants were given the final writing prompt at the end of the semester, during final exam week. Examinations are a major event in the semester, and "exam week" is associated with higher levels of stress and lower levels of life satisfaction among college students (Austin et al. 2010). As an ungraded assignment (necessary for IRB approval) at a busy time of year, participants may not have engaged as seriously with the prompt as researchers would have hoped. Distraction may have been a factor limiting observational skills and critical thinking, while problem solving and linguistic expression skills were still shown to be maintained or strengthened by the end of the semester. To mitigate this factor in future iterations of the research project, the final writing prompt could be given two weeks earlier, when student workload may be lighter or during the last meeting.

However, we theorize that the most significant factor impacting the results of this study was the virtual nature of the experiment, delivered in a time of pandemic. The qualitative research about the benefits of VTS shaped the hypothesis for this research study, as did prior international experiments that followed a similar protocol and utilized the same measurement tool (D'Egidio 2018; Ferrara et al. 2020). However, these existing studies were all conducted in person, with group discussion in a physical museum or classroom environment utilizing material artworks. The COVID-19 pandemic disrupted plans to conduct this experiment in person, while also contributing variables such as higher levels of stress and anxiety among students, which can detract from the attainment of learning outcomes (Besser et al. 2020; Yang et al. 2021).

In their final reflections about the course, 30% of students in the experimental cohort wrote about "struggling to adapt to the circumstances of the pandemic" – describing "loneliness," "isolation," and "the most difficult period for [my] mental health." Emergent research is demonstrating that mental health, loss of focus, and difficulty managing learning resources negatively impacted student learning online during the COVID-19 pandemic (Maqableh and Alia 2021); this may be reflected in this study's data, which demonstrates an unexpected lack of progress in cultivating general education skills. Assessing students' stress levels when participating in VTS-responsive writing assignments may help us determine the role that emotion plays in the achievement and/or manifestation of general education competencies.

In addition to the broad challenges with moving learning online during the pandemic, specifically the use of virtual visual art may have been a variable that impacted results. In their end-of-semester written reflections, five of the 27 students in the experimental cohort, unprompted, expressed a desire to have been in-person in a museum setting to view and discuss art, rather than online. Art theorists have been debating the merits of viewing art in person versus online for a decade and academic research is divided on the question. Physically visiting cultural institutions, including art museums, is shown to improve critical thinking and information retention (Greene et al. 2014), and individuals report taking away more value and meaning from experiencing an original, physical artwork than a reproduction (Newman and Bloom 2012; Lorusso and Natali 2015). However, other studies have found viewers analyzing artworks in "largely similar" ways, whether the work was viewed in person, in a slide projection, or on a computer screen (Locher et al. 1999; Locher et al. 2001). While the Visual Thinking Strategies organization offered virtual sessions and trainings during the COVID-19 pandemic (Visual Thinking Strategies 2020), no research has been published to date comparing the efficacy of online to in-person sessions. Repeating this experiment with an online cohort and an in-person cohort and limiting all other variables would help determine the significance of our current findings, and may shed light on why some but not all general education competencies improved in this experiment.

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