

What's Art Got to Do With It? Using Visual Thinking Strategies to Develop Critical Thinking Skills

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Abstract

Visual Thinking Strategies (VTS) is an experiential exercise readily adapted to the management classroom. Through this exercise, instructors use a structured process to help students develop and apply critical thinking skills, with a focus on clearly articulating a concept, explaining their reasoning and use of evidence to inform their claim, interrogating assumptions, and exploring a range of perspectives. The exercise involves guiding students to interpret first visual artwork and then other texts through the use of guiding questions and specific facilitation strategies, followed by a practice and a debriefing. Additional adaptations discussed in the appendix, such as using VTS with graphic organizers from a course text, the landing page of a multinational company website, a SWOT analysis, or quantitative datasets, are a testament to the versatility and flexibility of this strategy in building students' critical thinking skills across management contexts.

Keywords

visual thinking strategies (VTS), critical thinking skills, experiential learning

Critical thinking skills are essential in the business world, where leaders seek candidates who can clearly articulate questions and needs, assemble and evaluate evidence to inform decisions, apply creative and logical reasoning, and actively explore

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alternate perspectives when examining problems and proposing action (Bhatia et al., 2022; Coleman, 2022; Padurean, 2021; Pontefract, 2019; Santos, 2022).

Helping undergraduate and graduate students build critical thinking skills is a necessary part of management education, especially in foundational coursework. In the management classroom, a focus on critical thinking can illuminate tensions between a student's own assumptions or interpretations and those of another (Paul & Elder, 2020); help students develop the skills of professional, respectful skepticism (Liu, 2018); and support the integration and development of communication, teamwork, ethical orientations, self-awareness, social-awareness, and emotional intelligence (Salmon et al., 2022; Sánchez et al., 2014; Smeby & Heggen, 2014; Yang et al., 2023). It is no surprise that business accreditation bodies such as the Association to Advance Collegiate Schools of Business (AACSB), the European Foundation for Management Development Quality Improvement System (EQUIS), and the Association of Masters of Business Administration (AMBA) emphasize the importance of these skills for success in the workplace (Padurean, 2021), to meet ongoing challenges in the field (Mullins, 2023), and to meet accreditation standards (Association of MBAs, 2022).

Building students' critical thinking skills is challenging work for management educators. Here, we present an instructional approach that engages students in experiential, inquiry-based learning, through which they practice interpreting a range of texts, articulating reasoning, and deliberately engaging with diverse perspectives. In both undergraduate and graduate contexts, even reticent students are actively engaged, providing a greater diversity of perspectives.

Theoretical Foundations

Our use of this instructional strategy draws on two bodies of work: (a) Richard Paul and Linda Elder's (2020) approach to critical thinking and (b) Philip Yenawine and Abigail Housen's work on visual thinking strategies (Yenawine, 2014).

Paul and Elder's Approach to Critical Thinking

For well over two decades, Paul and Elder's work has been central to understandings and practices related to critical thinking (Paul, 1995; Paul & Elder, 2001, 2020). The authors define critical thinking as "the art of analyzing and evaluating thought processes with a view to improving them. Critical thinking is self-directed, self-disciplined, self-monitored, and self-corrective thinking" (Paul & Elder, 2020, p. 9). Toward making these goals actionable, Paul and Elder (2020) identify intellectual standards (e.g., clarity, accuracy, relevance, logicalness, significance, fairness), which must be applied to elements of reasoning (purposes, questions, points of view, information, inferences, concepts, implications, and assumptions) to develop focal intellectual traits (e.g., intellectual humility, intellectual integrity, intellectual courage, confidence in reason, intellectual empathy).

We focus our work with this instructional strategy on several of Paul and Elder's elements of reasoning, specifically on helping students (a) clearly explain their concepts to

an audience, (b) identify and examine the information they are using to inform their stance, (c) interrogate their assumptions as they make inferences, and (d) examine other points of view that may be relevant. In targeting these elements, we are working to help students build the focal intellectual standards and the intellectual traits noted above.

Visual Thinking Strategies

We adapt Visual Thinking Strategies (VTS) to develop the elements of reasoning noted above. Originally developed by Philip Yenawine, former education director of New York's Museum of Modern Art, and cognitive psychologist Abigail Housen, VTS helps students practice articulating a stance, explaining inferences they make from specific information, and examining their assumptions alongside other points of view. It is a process designed for structured inquiry into visual artwork, which we expand to additional visual texts (i.e., texts with a significant visual component, such as photographs, paintings, graphs, diagrams, data displays, models, etc.).

VTS centers three guiding questions, which are repeated throughout the exercise (Yenawine, 2014). The first question asks students to articulate an interpretation (to tell what is “going on” in the visual), thereby requiring higher-order thinking according to Bloom's Taxonomy (Armstrong, 2010). The second question requires students to make a deliberate connection between their interpretation and evidence (to describe what they “see” that supports their statements). Together, the first two questions require students to practice making evidence-based claims and articulating their line of reasoning, while also expanding their ways of knowing and connecting with other perspectives (Dawson, 2018). The final guiding question asks for additional interpretations (what “more” can we see?), requiring students to consider, articulate, and evaluate alternate perspectives.

Learning Objectives

After completing the exercise, students will be able to:

- Clearly articulate both explicit and implicit interpretations of visual information
- Support inferences and interpretations with specific textual evidence/data
- Examine assumptions and explore alternative points of view
- Analyze how VTS and critical thinking skills directly relate to the work of managers

Instructions for Exercise

This exercise works best in a seminar class, with perhaps 30 or fewer students. Materials for the first steps include two different pieces of visual artwork and either a board or slide deck for recording discussion notes. While we have used these strategies with synchronous online teaching, we prefer face-to-face instruction in a classroom where students can clearly see the artwork. Instructors do not need external training in art or visual design.



Figure 1. Leopard.

Step 1: Engage Students in VTS Experience Using Visual Art (15–20 Minutes)

We recommend immediately engaging students in their first VTS experience (Stock et al., 2018) without much preamble; when students arrive, tell them we have something different in store and direct their attention to the first piece of visual art (we used Figure 1, *Leopard* by Jessica Salmon, available here: <https://jessicasalmonartist.com/products/leopard>). Beginning with artwork offers an engaging, nonthreatening context and also allows students to share a beginner stance together as a classroom community. We recommend using a visual aid with recognizable figures or animals, which may lend itself to students making and explaining narrative interpretations (Yang et al., 2023). As students settle down, we invite them to “take a moment to look, and then when you are ready, raise your hand and tell us, *What do you think is going on in this picture?*” After students look, hands start to go up, and the instructor can invite the first response.

When a student responds, the instructor uses several intentional questioning and instructional techniques. First, the instructor *restates* the student’s comments and *physically points* to relevant parts of the image. Then the instructor asks, “*What do you see that makes you say that?*” This second question invites the student to explicitly use visual evidence to support their interpretation. After the student shares, the instructor again *restates* their comments and *points* to the evidence in the visual to emphasize the connection between claims and evidence.

As the activity progresses, the instructor can use the same questions to surface students’ assumptions. For example, a student may use a gendered pronoun to describe a person or animal, and the instructor can ask, “What do you see that makes you say that X is female/male?” Table 1 provides an example of how this questioning may unfold,

Table 1. Illustrative Example of VTS Lesson Using *Leopard*.

Student/teacher interaction	Instructional purpose and significance
<i>Instructor to full class:</i> Take a moment to look at this painting. When you are ready, raise your hand to share what you think is going on in this picture. [Instructor calls on Student A.] <i>Student A:</i> I think it is a cheetah about to pounce on something. <i>Instructor:</i> Okay, Student A thinks this looks like a cheetah who is about to pounce on something. What do you see that makes you say this is a cheetah? <i>Student A:</i> It has spots all over it. I think that is a cheetah. <i>Instructor:</i> Student A notices the spots all over [points to spots on projected image], and these spots lead them to think this is a cheetah. And what do you see that makes you say it is about to pounce on something? <i>Student A:</i> Its tail is up and curved over its head and its back legs seem tense, like it is tense and ready. <i>Instructor:</i> Okay so the curve of the tail [points to curved tail on image] and the back leg position [points to back leg position] seem tense to you, and it makes you think it is getting ready to pounce. Thank you. <i>Instructor:</i> What more can we see?	Here, the instructor is asking students to take time to first look at the image, to form an interpretation (what they think is “going on”) rather than merely summarizing what they see or observe. Summarizing/restating the student response helps ensure the instructor’s accurate understanding without judgment or evaluation. Because the focus is on students practicing their <i>interpretation</i> of the image, rather than seeking a correct answer, the instructor focuses first on restating. Asking the student to specify the visual evidence behind any interpretations or assumptions (e.g., the species of the animal, the “feeling” that it is about to pounce) helps the student notice and respond to assumptions. Physically pointing to the visual evidence as the student describes it helps highlight the importance of being able to ground interpretations in “data.” Restating the student’s interpretation in relation to the evidence further reinforces connection between claims and evidence. Ending with neutral-positive feedback (“Thank you”) allows for equity across responses. By asking for <i>additional</i> interpretations, the instructor is explicitly seeking additional points of view. Rather than asking “what else,” which may imply that the instructor is seeking a particular response, they deliberately ask for “more.” Here again, the instructor is pointing back to the painting as they connect the student’s interpretations to the textual evidence. The questioning of the gender pronoun helps the student realize that they had made an assumption that was only partly based on the image; highlighting this assumption requires students to examine the picture again to see if their inference is supported by evidence. The instructor also ties this student’s comments back to a previous student, to show variation in interpretation. Doing so can promote the trait of intellectual humility.
[Instructor calls on Student B, whose hand is raised.] <i>Student B:</i> It looks like he is hot. I think he’s trying to rest, maybe at night, to cool down. <i>Instructor:</i> Okay, Student B is saying it looks like the animal is hot. You referred to it as “he”—what do you see that makes you think this animal is male? And what do you see that makes you think it is hot? <i>Student B:</i> I guess the shape of his head looks more masculine to me. Maybe because of the big forehead and nose? I don’t know. I guess I just assumed it was male. It looks hot because the mouth is open and so it looks like it is panting or trying to cool off. <i>Instructor:</i> So Student B noticed that they initially assumed that this animal is male because of the shape of the forehead and nose [points to forehead/nose], but then is wondering if that might have just been an assumption. And they thought the animal looks hot because the open mouth [pointing] looks like it is panting. This is different from what Student A said, where they thought the animal looks ready to pounce. Thank you. <i>Instructor:</i> What more can we see?	

(continued)

Table 1. (continued)

Student/teacher interaction	Instructional purpose and significance
[Instructor calls on Student C, whose hand is raised.] Student C: I was originally thinking that it was about to pounce too, but now I'm thinking it might be resting because it is night. Instructor: So Student C is thinking this might be at night and that might lead them to agree that the animal is resting. What do you see that makes you think this is at night? Student C: Well the background is black. Or is it dark blue or purplish? I can't really tell. Instructor: Come on up to the front to get a closer look. Student C: [comes up to painting] Oh, I see that it is purple and black together. This definitely makes me think it's at night. Like deep night time. Instructor: So when they look closer at the painting, Student C is noticing black and purple [points] and this is making them think this is deep night. Thank you. Instructor: What more can we see?	Here, rather than answering the student's question about the color of the background, the instructor invites the student up to the front of the class so they can determine their own answer. In this way, the instructor steps away, so that the student is directly seeing and interpreting the painting on their own, rather than deferring to the instructor. Doing so here leverages both information as an element of reason, and confidence in reason as an intellectual trait.
[Instructor calls on Student D, whose hand is raised.] Student D: I actually think this is supposed to be a leopard. It doesn't look like a true likeness, but I think it's a leopard and not a cheetah. Instructor: Student D is thinking this looks more like a leopard than a cheetah. What do you see that makes you say that? Student D: Well, I remember reading that leopards are more bulky and stronger, and this animal looks strong and more bulky around the middle section. Plus the markings are more like a leopard than a cheetah. Leopards have those splotches instead of dots. Instructor: So the bulkiness of this animal [points to image] and the splotches [points to image] instead of dots makes you think this is a leopard instead of a cheetah. Thank you. Instructor: What more can we see?	It is ideal if students are able to correct misconceptions on their own collaboratively, rather than having the instructor step in. In this case, a student is able to take the intellectually courageous step to disagree with a classmate and share specific rationale for why this is actually a leopard and not a cheetah. If it is important to fix misconceptions (e.g., if students do not fix misconceptions on their own and if it is important that they correctly interpret something about a text), try to guide them through questioning. For example, the instructor could say, "We've been saying this is a cheetah so far. How do we know it is not a leopard or a tiger? Do we perhaps need additional information from another source to help us decide?"
[No additional hands are raised.] Instructor: Okay, take another moment to look at the painting. What more do we think is going on here? What hasn't been said that might help us see this painting differently or in new ways?	There will inevitably come a point where no additional hands are raised, often after the most frequent participants have spoken. Here, try to give at least two additional minutes of time, perhaps even telling students explicitly that you want to get additional perspectives. Often after this slightly awkward wait time, new participants and new perspectives will be shared, which otherwise would have been missed.

while also highlighting the purpose and significance of the instructor's questions and instructional choices.

After a student finishes explaining their interpretation, the instructor thanks them and invites additional students to participate by asking, "What more can we see?" Here, the use of the word "more" is intentional, focusing students on adding additional interpretations (rather than implying that only one or two interpretations might suffice). As additional students share, the instructor continues to follow the aforementioned process, guiding each student to explain what they see in the picture that led to their interpretation, again physically pointing to the evidence in the image. In addition, the instructor highlights connections or differences across interpretations (e.g., "Student A is thinking that X means Y, but Student B sees that differently. . .").

At some point, responses may start to dwindle. We recommend waiting and lingering over the art (Yang et al., 2023), as this wait time is critical to providing space for more reluctant students to enter the conversation. Ask "What more can we see" again, giving at least 2 minutes before moving on. If students are particularly reticent, ask them to come up to the front of the class to look more closely, then jot down at least one additional thought.

Step 2: Debrief VTS Experience (10 Minutes)

As we wrap up our first experience with VTS, we ask students to raise their hands if they were able to "see more" as the exercise went on and to discuss what different points of view they experienced during the activity. We then shift to helping students analyze the critical thinking skills they used and the processes we followed.

Debriefing Skills. Immediately after concluding the activity, we ask students to respond to the following question: "What skills are we practicing, when we use VTS?" The instructor can ask students to write ideas for two minutes, or students can discuss with a neighbor. Once students reflect on their own, invite a class discussion and record students' responses onto a slide or the board.

During this first debrief discussion, we help students identify the critical thinking practices they used. If the class has exposure to Paul and Elder's framework, they can map their discussion of skills right onto that. If not, then the instructor can help students identify the ways they are using evidence to support their reasoning, unpack assumptions, and explore alternate viewpoints.

Debriefing Process. Next, guide students to identify elements of the process we used in this activity. Here, we help students identify the three focal questions we asked, ways we facilitated the discussion, and the significance of these actions. Table 2 shows the primary elements we help students identify at this stage.

Step 3: Engage Students in Second VTS Experience (10–15 Minutes)

Now that students have a beginning understanding of VTS and ways that these practices connect to critical thinking skills, we recommend providing one additional experience using VTS, an "eyes open" practice opportunity.

Table 2. Key Questions and Instructional Strategies for VTS.

Core questions	Instructional strategies
• What do you think is going on in this picture (or text)? • What do you see that makes you say that? • What <i>more</i> can we see?	• Start by giving everyone time to study the image. • Respect all answers equally. The goal is to communicate evidence-based interpretations. • Summarize each person’s responses while physically pointing to images, to help clarify and connect student comments with visual evidence. • Provide neutral-positive feedback to speakers (e.g., “Thank you”) rather than evaluative or comparative feedback. • Make explicit connections across student responses. • Seek multiple responses, representing multiple ways of seeing. • Provide adequate time for everyone to participate.



Figure 2. Cheval 01.

Leading students in one additional experience using VTS has the advantage of allowing them to apply what they have practiced with greater confidence and authority. At this stage, we can also use a more abstract image, requiring students to more deliberately explore multiple viewpoints, as well as the ways that different artistic elements (e.g., color, size, contrast) may affect their interpretations. We used Figure 2: *Cheval 01* for this second activity (by Jessica Salmon, available here: <https://jessicasalmonartist.com/products/cheval01>).

Step 4: Connect VTS to Management Education (10 Minutes)

After responses have concluded, ask the students to again think-pair-share while answering the question “How do these skills and this activity relate to the work of

managers?” This final discussion pushes students to begin to articulate the significance of critical thinking skills in the work of managers. As the instructor records student responses on a slide or the board, ask for clarification and elaboration as necessary and guide students to use course-specific terms and concepts.

After these initial experiences with VTS, we can integrate the strategies using texts related to management coursework. Appendix A outlines several such applications.

Conclusion

VTS offer management students and instructors a powerful experiential tool to build critical thinking skills. The instructional strategies discussed in this article are rooted in inquiry-based, experiential traditions, designed to help students practice making evidence-based claims, articulating their reasoning, interrogating assumptions, and exploring a range of perspectives. In doing so, students are targeting focal elements of reasoning laid out by Paul and Elder (2020).

Our ultimate goal is for students to internalize the questioning strategies discussed earlier. As management educators, we want our students to be able to ask themselves what they think is going on in a situation, a company, or a dataset and then point back to the information they use to make those conclusions. Just as important, we want them to ask what are other ways of seeing the data or situation they are analyzing, especially as they seek to include diverse perspectives. Ultimately, we also hope that students will adapt this questioning process as they engage in collaborative work, using nonthreatening language to help push critical thinking in peers and colleagues.

Appendix

Variations and Extensions

After the initial steps mentioned earlier, there are many ways to continue working with VTS, either by adapting the activity to other types of texts or by adapting the questioning to fit particular learning goals.

Analyze and Redesign a Figure from a Textbook

Many times, students skim over the figures and graphics in their textbook, thereby missing valuable opportunities to deepen their conceptual understandings. Begin by choosing a significant graphic, figure, or table from your textbook. Then invite the students to interpret the original format using the VTS questions (What do you think is going on in this figure? What do you see that makes you say that?). After initial responses, the instructor may want to guide students to think about specific visual design principles, such as proximity, size, use of color, and so on (Kuba, 2021), evaluating how these factors shape their interpretation of the image (Costello & Brunner, 2016).

If the image is proving challenging to students, consider adding a step, asking students to work in teams to identify the primary meaning they believe the graphic is attempting to communicate. The instructor can also divide students into small teams to re-craft the original graphic to clarify and enhance the meaning (e.g., simplifying, reprioritizing, changing the colors, moving the boxes, etc.). We chose to have students build their revised graphics in a shared Google Slides presentation, issuing each student group a slide.

Having all student groups create slides in a single slidedeck facilitated sharing at the end of class and allowed us to monitor progress. After students completed the activity, student teams were invited to interpret the redesign of a *different* student group (this was the “surprise” moment—where they used VTS to interpret peer images). The interpreting team gave their analysis, then the student group who made the image confirmed/clarified and added comments.

Analyze a Company Website

The VTS questioning strategies from this article also work well with analyzing a company’s website. We started with giving students time to peruse the landing page of a company website. We slightly modified the guiding questions, asking students, (a) based on the landing page, what do you think is going on with this company? (b) What do you see on their website that makes you say that?

This activity also allowed students to consider how some websites might make certain audiences/stakeholders feel included or excluded (i.e., “invisibilized” stakeholders) in a company’s mission or offerings (e.g., Agogué & Blanche, 2023). This activity can be expanded for contrasting businesses as well. For example, we used a target company and three counter-examples from the same industry to promote cross-case analysis (e.g., Ellevest vs. Vanguard, T. Rowe Price, and Fidelity Investments from the financial services industry). Here again, critical thinking skills are central to this activity, as students explore real-world images and the assumptions, biases, and perspectives they represent.

Build and/or Evaluate SWOT Analysis

VTS may also be adapted to help students better understand, analyze, and create a SWOT analysis, one of the most basic of management tools. The instructor can work with students to build a company SWOT analysis using the VTS questioning prompts. Students will need access to direct (e.g., company website) and indirect (e.g., news articles about the company and industry) sources. Here, we ask students (a) What do you think is going on with this company? and (b) What did you see from your sources that makes you say that? As students collaborate and share across teams, they also consider (c) What more can we see?

Once students have built a SWOT analysis for a given company, the instructor can adapt the questioning prompts again to help students extract themes and higher-order

interpretations from their SWOT. Here again, the emphasis is on using the text (in this case, the SWOT analysis) to make evidence-based interpretations about a company.

Interpret Quantitative Data

These strategies also may be adapted for work with a quantitative dataset. Invite students to interpret raw data using modified VTS prompts: (a) Based on the data, what do you think is going on with this (e.g., country, company, etc.)? (b) What do you see in the data that makes you say that?

One way to transition into quantitative data analysis is to examine data that can be readily viewed in graphical format and has an easy-to-grasp variable meaning. For example, Transparency International (2022) issues an annual Corruption Perception Index which is always provided both as (a) a color-coded interactive globe and (b) as a publicly available raw dataset. Both reveal the rating—on a scale of 0 to 100—where 0 is highly corrupt and 100 is very clean. The Corruption Perception Index webpage is annually updated, and it provides a simple dropdown menu to toggle across years, if the instructor wants to compare over time.

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