

## **Graphic Instructional Pedagogy Critical Literacy Skill Development Using Low Art**

**James O. Barbre III & Joshua B. L. Tolbert**  
*Indiana University East*

### **Abstract**

The presence of graphic literature and novels in schools is commonplace. An area of instruction that is currently lacking across much of schooling is the concerted and focused use of graphic literature and novels in teaching a variety of subjects and content. Teaching with this kind of literature as a vehicle for inquiry and meaning-making can be highly effective when utilized in the right fashion. Incorporating a dimension of aesthetics and critical inquiry within graphic novels will yield a much more immersive learning experience. Borrowing from an art teacher's pedagogy, any subject can be invigorated or simply re-presented in a visual means. Graphic literature has the ability to connect the important concepts and ideas that students learn in school, but in a way that blends in the kinds of imagery that are commensurate with what students see outside of school. Combining critical inquiry with graphic literature will be argued to present a more appropriate level of intellectual and aesthetic engagement for teachers and students in the process of teaching and learning.

*Keywords:* graphic novel, pedagogy, assessment, critical inquiry, critical literacy

### **Introduction**

Graphic novels and comic literature are no strangers to teaching settings. As a medium and an art form, both bring unique contributions to the student's reading experience and development of visual literacy

skills (Brenna, 2013). The nature of the reading transaction in a visual context develops a more complex understanding of the story because it occurs on numerous learning and meaning-making levels. While the nature of any literary medium serves to communicate a certain message or experience, it is both necessary and preferable that it be interesting.

In the 21st Century, and with the kinds of primarily digital visual messaging with which students continuously interact, it is natural to place a substantial amount of value on these visual messages and their level of influence as it applies to the student organizing and understanding what they learn or study. This connection of meaning should lend itself more readily to literacy instruction and the development of a modern critical literacy skillset. We will argue that incorporating graphic reading materials across any subject or curriculum will more closely approximate the nature of everyday information that modern students digest.

Citing Pinar's (1994) concept of a cumulative body of text, school subjects such as history are packaged and delivered in a normative way, as is literature. Expanding on the prose-heavy approach of textbooks and/or novels through the incorporation of graphic narratives adds an effective dimension and perspective to the information or content being presented to students. By the practice of incorporating a stronger visual element, students are better able to connect different bodies of knowledge and meaning. This applies to the interpretive value and aesthetic factors of the graphics. This instructional approach also models the kind of skills necessary for students to be critical thinkers. A modern literacy skillset is one that involves familiarity and ease of operation among a variety of different web-based social media and other communications platforms. As demonstrated by Bannert (2002) and Sparks (2015), images can be vital to communicating information in ways that can decrease the cognitive load required for processing, so long as students also possess the background necessary for deriving meaning and synthesizing new information with what has been previously learned. Understanding the instructional value of this presents the possibility for any teacher to substantially bolster their instruction's effectiveness through the correct incorporation of graphic and other materials that further develop visual literacy.

The instructional argument here is not one where there is a specific 'to do' list as it relates to the use of graphic narratives. Rather, we will argue that teachers in different grades and subjects will utilize this approach in unique ways. Therefore, we will suggest general guidelines to frame the instructional approach. Our assumption is that individual educators know their own educational standards, academic content, and

student bodies. Understanding the value and viability of this kind of graphic literature means that the teacher may look at the curriculum they teach and see where these may fit, rather than completely changing pedagogy or content in the pursuit of 'getting students to understand'.

### **Graphic Novels and Comic Literature**

Developing a pedagogical framework utilizing this medium and focusing on this inquiry and student work in ways that develop critical literacy represent a natural extension for adapting graphic novels and similar materials for teaching (Jacobs and Low, 2017; Möller, 2016; Wang, 2017). This involves the use of a cross-disciplinary approach to curriculum planning and execution. Developing this framework demonstrates a focused and specialized treatment and interpretation of literary materials (Nappi, 2017). Readers unlock greater levels of meaning when they know what to look for and, perhaps, ask questions when they do not (Dallacqua, 2012).

Graphic novels enjoy a wide berth of creative interpretation and presentation as they present a new story or adapt an existing work. The infusion of imagery and the reader's experience in this kind of time and space expands the story's form, scope, and impact. Comic literature presents a similar impact, but is more strictly configured into the received form that comics must occupy in the present consumer market (Chute, 2008; Duncan, Smith, & Levitz, 2015). A unique feature to comic literature lies in the creative ways that authors and artists present a complex story within a prescribed number of pages and frames of illustration.

Both forms of graphic literature offer the teacher a considerable visual and information resource, either primary or secondary in nature (Rashid and Qaisar, 2016). A shortcoming to the present use of these mediums in education lies in the pedagogy through which they are conceived. Typically, titles from this genre tend towards fiction and are written for mass audience consumption, be it in K-12 or otherwise (Benson, 2016; Boatright, 2010; Irwin, 2014). As these kinds of mediums have never really enjoyed the focus of instructional or curriculum planning, the essential forms of pedagogy that support engaged learning through graphic narratives are not cohesive or focused as its own pedagogy. This form of teacher instruction certainly resides in art education areas, but the general pedagogy of visual analysis is not common across school subjects. A proper discussion of graphic instructional pedagogy requires the presence of teaching art instruction, as well (Acuff, 2015). The potential learning impact presented by both graphic forms deserves a more considered approach.

We assert that developing a cohesive pedagogical framework structured around supporting this genre of literature would add value to the instructional process, overall. This pedagogy is not relegated to a few classes or subjects in school. Instead, it stretches broadly over multiple areas and incorporates essential dimensions of critical thinking and analysis, aesthetic theory and appreciation, and subject-specific strategies which arise from the use of this literature. While different subjects or classes may have different outcomes, the student derives value from engaging with any information in a manner that is more visually striking.

### **Normative Literacies in Teaching and Learning**

Traditional literacy instructional strategies are fairly common across schools as a normative means of teaching and learning. The methods remain rather constant, although the curriculum content may change over time (Mitchell, 2006). As a result, literacy practice is familiar to students, regardless of newer titles or content they may read. The mechanical nature of this experience is one that students and adults recognize when they are immersed in it. As a result of this teacher-centered approach, students are mostly receivers of information who are asked certain predictable kinds of comprehension questions which are oriented to some level of understanding and mastery. These instructional means are reinforced by the student's work and resulting assessment measures. As one moves up through the grade levels, these forms become less visual and more narrative-based, but remain largely the same in terms of their focus and purpose in teaching.

The shortcoming to this instructional approach lies in the assumptions it makes about what interests the reader in the first place (Mitchell, 2006). A majority of books read for the purposes of any class tend to be compulsory in nature. This is natural, as it relates to the function of both curriculum and assessment. An important role of teachers is to introduce students to concepts and purposefully facilitate students' continuing interactions with the curriculum. The complex and ongoing nature of literacy instruction is notable, and our intention is not to minimize or diminish this. However, the basic set of assumptions that would naturally guide the planning of any curriculum are largely absent in this situation.

Students, whether young or old, become used to the mechanical and repetitious routines that accompany this form of learning (Adams, 2012). To use a video game analogy, it's the same basic package, just in different skins. Routinized learning may have some staying power, but rarely leads to critical thinking. Whether students sit down to complete

a worksheet, some version of review questions, or explore an ‘extension’ exercise or activity, they recognize when a lesson or topic is canned. Any former school student can attest to those similar feelings when we arrive at the end of the chapter or section and then more to complete the review or other questions. These feelings come about through the sheer force of mechanical repetition.

This should not serve as any kind of excoriation of teachers and for the nature of how the curriculum works or how their students interact with and draw value from it. Modern professional educators operate in a very tight physical and professional space when it comes to the ability to be creative teaching professionals and ensuring that all of the assessment and other classroom responsibilities are met. They understand their students’ avenues of interest since they hear about them most days in school. The ability to connect these areas of excitement and interest to academic subjects represents the goose with the golden egg and this represents a pedagogical imperative (Hassett & Schieble, 2007; Jacobs, 2007).

Eisner (1998) offered insight into the aesthetics aspect of learning and education when he observed those numerous traditions that have been employed by people to describe and interpret their constructed world(s). These include history, art, literature, dance, drama, poetry, and music as the most common forms. Numerous elements and principles converge in understanding the aesthetics of art, whether it is learning about a subject or topic initially, or simply experiencing it. Among these important elements are color, form, line, shape, texture, and value. The convergence of these elements creates a lasting value and image to the viewer, or more precisely the student of the image(s). The purposeful integration of visual stimuli into instructional experiences can help to create stronger constructs that can overcome limitations in working memory and promote the processing of information into long-term memory for richer exploration and application (Sweller, 2005). These images form the graphic text that serves as something symbolic or real or both to people who hold those same images as extensions of their own sense of identity or cultural experience.

### **The Enjoyment and Experience of Literacy**

Educators know that real and dynamic learning represents a deeply held commitment. Effective teachers recognize that students can become heavily invested in learning new topics, and that interfacing with new material can engage diverse perspective and spark meaningful connections. Harnessing this engagement and interest from students neces-

sarily involves the use of effective criteria in making these curriculum planning decisions (Boerman, 2015; Brenna, 2013). Understanding this relationship between learners, content, and pedagogy within the parameters of the curriculum and resources that one has to operate with often necessitates doing the best one can with the resources one has.

A more material and content-related approach represents only a narrowed range of possibilities in relation to the potential learning impact. Another way to approach this would be through the construction of a framework of critical lenses for use in better understanding the subject area and its breadth (Mitchell, 2006; Wang, 2017). This generalized, but critical, skillset then applies to a range of different situations where ‘compulsory’ is not part of the flavor. It also addresses important process-oriented components of educational standards. This medium is proven in its ability to present the perspective and experience of other groups and sets of experiences (Connors, 2015; Hii and Fong, 2015; Schwarz, 2010).

### **A Pedagogical Framework for Visual Critical Literacy Skills**

Critical thinking, teaching, and analysis are not new to classrooms, though the manner of its form is often dictated by the subject or discipline and what it is intended to achieve. The advantage of a critical thinking framework lies in its ability to be readily applicable across a range of disciplines and subjects (Duron et al., 2006; Wilson, 2014). A normal response to this would be to say that this is the point of literacy instruction in the first place. The shortcoming inherent to this sentiment lies in the assumptions of student interest and engagement about the subject matter, and whether this is the same thing, just wrapped up in a different skin.

Numerous perspectives and strategies for critical thinking exist, and Duron et al. (2006) emphasized that the essence of critical thinking lies in learners analyzing information and evaluating ideas. This self-actualization is a key element to enduring critical thinking and a centerpiece of a learner-based theory of critical thinking promoted by Elder and Paul (1994). Paul and Elder (2009) have more recently described the stages of critical thinking development as having six general levels: 1) the unreflective thinker, 2) challenged thinker, 3) beginning thinker, 4) practicing thinker, 5) advanced thinker, and 6) the accomplished thinker. The primary thrust of the modern literacy curriculum lies in addressing the first four (4) levels. However, the domain of advanced thinkers and accomplished thinker lies at the cusp of this learning experience. The breadth and depth to be troved by the learner is heavily influenced by the information presented.

### **Graphic Literature's Potential Contribution**

The use of graphic literature in literacy instruction is most effective when it is a structured experience, but facilitated as an aesthetic one. A core component of for any reading experience lies in the value given the text by the reader. When reading a text to acquire information, students are more likely to connect deeply when a text provides information they need or want. The transactive space where the deeper and more intimate meanings take root and become embedded require unique materials and circumstances. In the ways that students both remember this exploratory aesthetic experience or use it as a lens through which to view a future problem or situation, the value is derived from their interaction and subsequent meaning-making associated with the particular literary medium. This subsequent value may manifest in any number of ways through writing or other means of composition (Calo, 2011; Dallacqua, 2018).

Graphic literature has a number of instructional and pedagogical strengths, but chief among them is the addition of imagery and perspective onto an already complex story or plot (Schieble, 2014). In this space, the reader has a panoply of ways they may explore the text. Some readers will read for imagery, while others read for the connection between dialogue, with characters still present, but situated more in the background and helping to convey the story along. Guthrie and Wigfield (1999) asserted that text comprehension is innately tied to motivation and a learner attending to and interpreting key elements on the page.

### **Graphic Instructional Pedagogy: A Framework in Critical Literacy**

The transactive space between the teacher's methods, the materials presented, and the subsequent value drawn by the reader is partly built on fueling the necessity or urgency to explore further and understand more. Students in classes where critical thinking and reasoning are employed become readily aware of the difference between a basic versus advanced understanding of a topic (Wilson, 2014). According to Paul and Elder (2009) the most advanced order of critical thinking both requires and simultaneously develops the skills and dispositions necessary to directly engage in transformative reading and understanding. This level of skill, reflection, and consistency in fairness in how any student approaches the study of a topic is the goal for every academic subject. In cultivating this, students develop a critical literacy that enables them to better navigate and make meaning through the volumes of information in their lives.

The pedagogy behind graphic instruction is built on the framework of critical literacy. Further, it incorporates the standards and goals of more than one academic subject, namely through the addition of pedagogy in art instruction and inquiry. The academic subject incorporates a tiered framework of instructional resource and support. These tiers are: 1) art theory, aesthetic education and inquiry, 2) critical pedagogy through facilitation of analysis, writing, and reflection, and 3) creation of meaning through assessment.

### **Incorporating Art Theory and Inquiry**

In order to teach with an aesthetic in mind, the teacher must approach the topic in ways that would mimic parts of the pedagogy of an art teacher. The tiers of aesthetic education and art theory are necessary so that the text or narrative topic of study has an expansive and engaging dimension to it, rather than being based on recall or surface application, as is common in most mastery-based learning settings. Aesthetic education relates to the character and form upon which a particular practice or orientation is founded. Hamblen (1984) explained how the process of art criticism incorporated the higher-order thinking and questioning of Bloom's Taxonomy; Broome et al. (2017) later explored how artistic critical thinking illuminated a path for critical exploration of issues related to social justice. As both a metaphor and instructional practice, art has a useful and descriptive quality in understanding the culture and how it is reproduced and disseminated in the context of people who experience it. Across various groups of diverse people, different images hold sway. This means that certain images hold greater currency in representing particular aspects of the human experience.

Principles of art include balance, contrast, emphasis, proportion, pattern, rhythm, unity, and variety. Through the convergence of these elements and principles, different styles emerge. Through an individual or group's affinity or kinship to certain forms of imagery, and so to one another, the value of this common symbolic representation holds its most significant influence. From the perspective of art as education, styles such as abstract, baroque, neo-classist, surrealism, luminist, pre- and post-impressionism emerge and are disseminated to those who would view them, hence consuming the images they present. The observer and student of art will likely fancy several different available styles, but their tastes inevitably find some preferences over others. The ultimate and resulting preferences are then oriented around the acceptance of certain genres and the rejection of others, which they may find aesthetically unfavorable for any number of reasons.



The stylistic elements and dimensions of art converge to provide means of communicating to the observing participant the intent behind the efforts and results of the artist(s) or author(s). One need only observe modern advertising or popular culture examples to observe the kinds of currency that these images are attempting to create in the mind of the recipient observer. The recipient observer is presented with this work where some interpretation occurs. Agreement, rejection, curiosity, or disinterests are all facets of possible results to this interaction, but there is a resulting and value-added interaction when planned and guided properly.

### **Normative Modes of Discussion in Art Class**

Whether a class serves the purposes of student-produced works of art, or studying history, the art instructor often provides the vocabulary and conceptual development that enables the learning process. Through teaching, students learn important concepts and a vocabulary in representation and interpretation. The pedagogy that teaches these concepts readily applies outside the classroom in much of what the students see. Students naturally make these connections, whether explicitly addressed by the teacher or not.

The movement to discipline-based arts education (henceforth referred to as DBAE) in the late 1980s signaled a shift from focus on art production, to a more critical and comprehensive approach that also emphasized aesthetics, art history, and art criticism (Delacruz & Dunn, 1996). Although the days of DBAE being heavily promoted or explicitly taught in educator preparation programs may have passed, some of the fundamentals of DBAE have been absorbed into the contemporary approach to teaching art in a pluralistic, technology-rich environment. Gude (2007) argues that a tangible relationship between art education and the larger social context in which students live represents a natural and required facet of human understanding. They must naturally and simultaneously hone their perceptions of both the visual elements of art and an ability to recognize or analyze the environment in which art has been created.

In many ways, a legacy of DBAE is that art educators integrate history (or social context), criticism, and aesthetics as part of a dialogic process; educators informally prompt students to consider these dimensions, and formally pose questions to students during structured critiques of the work of both peers and professional artists. As a result, teachers of art must be adept at utilizing a model conducive to flowing naturally between questions related to visual form and more critical or exploratory questions.

As an example, an art teacher might ask students to engage in a critical discussion of a highly stylized painting, such as Joan Miro's *El Sol* (<https://www.moma.org/collection/works/67005>). With respect to visual literacy, the teacher could naturally ask students to describe the use of balance, rhythm, or primary colors. Along similar lines, the teacher might prompt students to determine whether the various shapes or symbols serve to represent people and real-world objects, or if they serve more idiosyncratic or abstract purposes. Along more critical lines, it would not be uncommon for an art teacher to ask students to explain who they believe the creator was, when they made this painting, or perhaps what the intent or purpose of the work was for the artist. This latter line of questioning is not carried out with the expectation of students knowing exact factual information, but more to gauge perceptions and formulate connections. In essence, this activity's results further refine the student's natural ability or inclination to ask further questions, but of a critically-focused nature.

This general model of visual inquiry holds formidable implications for graphic literature, as learning to appreciate graphic literature often hinges upon similar understandings which lead to formal and critical analysis. Any given panel or page of graphic literature can be described or critiqued, concerning how formal elements and principles of design are incorporated and married to text. Exploring the perspective of the author/artist of graphic literature can be analogous to a structured critique of visual art, as well as a tool for developing skills for critical textual and conceptual analysis. Ultimately, similar processes or questioning can be used with texts across disciplines and content areas. This would facilitate the exploration of policies or proposals, the evaluation of scientific/mathematical models, and any number of other discipline-specific skills with which students are ultimately asked to demonstrate proficiency. A key result is a better ability to communicate and exchange ideas. As supported by Campbell (2011), the ability to engage in dialogue is crucial to combatting the compartmentalization of different subjects, disciplines, and modernist misconceptions. That might prioritize mathematics and the hard sciences as bastions of the rational while largely positioning the arts as emotional or trivial.

The experienced art teacher plans for this transactive moment of interpretation between the materials they select and their student's reactions to them. They are comfortable with the idea that there is no one way of interpreting a work of art, regardless of the artist's intent or the framework of interpretation used by the recipient observer. The point in the exercise is to elicit further discussion, exploration, and the construction of meaning. It would be wrong to assume that a fleeting

set of images were all that any student ever learned about a topic. From an instructional perspective, the teacher is facilitating a longer-running process of discovery and learning on the part of the student (Hamblen, 1984; Milbrandt et al., 2004). Classes may end, but students will encounter similar information in the future. Their later interactions with such material will be grounded in the methods they encountered and used to explore this information in school. In this particular context, learning and understanding is tied to the inherent aesthetic connection between a graphic image and the person who sees it. The critical thinking teacher outside the subject of art plans for the same process and outcomes, albeit through different means.

### **Inquiry Through the Use of the Aesthetic Lens**

Through the convergence of these factors of aesthetics, the individual or group will likely develop a multi-faceted lens through which they interpret and subsequently navigate the world of images before them. Milbrandt et al. (2004) fostered students' use of a constructivist approach to support their independent exploration of the visual arts, and Lemoni et al. (2013) asserted that a constructionist method empowered students to interact with the content in science textbooks in richer ways. It is important to readily observe this argument's limitations because it is impossibly complex to predict as to which genre or form may be preferred by the observer; there are simply too many variables. However, this does come about as a result of interacting with these images or other symbolic representations. An interpretive lens is important because of the comfort, familiarity, and sense that people derive from it. How else to explain how we decorate the places in which we live?

### **Graphic Instructional Pedagogy Across Disciplines**

A pedagogy for graphic narrative instruction has common elements and features that necessarily cross traditional subject boundaries. The necessity to question and actively construct meaning naturally means that the academic subjects and sources will be far more intertwined and often allowed for direct instruction. This represents an important landing point for a critical literacy framework. Several example titles in this section will illustrate this point.

#### ***English***

Graphic novel adaptations of classic literary works have existed for decades, and sometimes have been used in classrooms as either supple-

ments or substitutes for the reading of novels (Boerman-Cornell, 2013; Brenna, 2013). This practice has often been employed by students with dyslexia or other reading challenges, as a way to compensate for difficulties in reading fluency or reading comprehension (Smetana & Grisham, 2012; Smith et al., 2019). Visual texts ostensibly use illustrated forms to improve the odds of struggling students absorbing plot points, recognizing emotional states of characters, or heightening the interpretation of dialogue. Although this method can be well-intentioned and beneficial, graphic literature possesses wider possibilities and should be open to a broader spectrum of students as a means of challenging or changing their relationship with literature.

One possibility would be to have students read a chapter or portion of a classic text, such as Shakespeare's *Macbeth*, then to contrast this with a reading of the same section of a graphic novel version of *Macbeth*. Discussion or analysis would ideally center on whether the graphic adaptation captured the spirit of Shakespeare's work, whether illustration enhanced the experience, or the degree to which the combination of both versions created a deeper construct for understanding. This general comparative exercise would also be a foundation for integration of other media or disciplines.

For example, viewing part of Kurosawa's adaptation of *Macbeth*, the 1957 film *Throne of Blood*, would permit discussion of how Shakespeare's themes and craft translate across different media and cultures. Pursuing a more critical direction, the above would also facilitate the discussion of whether the *Macbeth* graphic novel and *Throne of Blood* are really even adaptations of Shakespeare's work, instead of being creative works that reference Shakespeare. Using an analogy from popular music, this analysis would be like making the distinction between an artist playing a cover version of a well-known song versus an artist using a sample from an existing song as the framework for a new piece of music.

### ***Social Studies***

Graphic literature can be an effective tool for presenting complex concepts from the social sciences in accessible ways. Goodwin (2012) demonstrated the power of graphic novels as a medium by collaborating with an illustrator to craft a comprehensive and appealing text covering principles of the field of economics. Similar to what was described in the section on English, the work of Goodwin (2012) could readily serve as a supplement to more traditional instruction on a topic or historical period in economics. A critical evaluation of Goodwin's *Economix* would also offer rich possibilities, including discussing the extent to which

the book's illustrator Dan E. Burr impacted the presentation of the content, or having students take a position on whether or not Economix accurately or effectively presents an explanation of a particular aspect of economics. The last line of discussion could be incredibly productive. It would require students to have a firm grasp on the content and use higher-order skills in taking a position and providing a rationale.

A key to social studies education is that students have opportunities to access and appreciate different perspectives. The use of graphic literature as a component of teaching history could lend itself richly to the experience of deeply exploring multiple views of events in the past. For example, students in the United States are certain to learn about the Japanese attack on Pearl Harbor in 1941. The creation of graphic literature for this historical event would promote differentiation by product, in which students would illustrate the experience of the bombing of Pearl Harbor from two different perspectives (a Japanese dive bomber, U.S. sailor, civilian living in Hawaii, etc.). This activity could be further enriched by teaching students about the Japanese bombing of Darwin in 1942, which stands as the largest attack on Australia by another nation. In particular, this region's aboriginal Australians had a radically different view of the Japanese attack, based in their unique cosmology/mythology and perception of the world around them. Contrasting the different ways in which soldiers in Hawaii and aborigines in Darwin processed and responded to attacks by Japanese aircraft through graphic literature and discussion would add depth and dimensionality to the study of this period of history. Otherwise, readers are only left with the standardized textbook-based curriculum, which presents information in ways that do not always promote critical literacy or inquiry (Adams, 2012).

### ***Science***

Scientific phenomena can be both directly observable and profoundly theoretical in nature. Radoff et al. (2012) described the use of discussion about toy cars as a way to responsively teach third grade students about energy and motion. The approach employed in the research of Radoff et al. (2012) clearly incorporated inquiry and stimulated students to think critically and creatively as they developed new understanding of fundamental concepts in physical science. Still, it is not difficult to imagine that incorporating graphic literature as part of this instructional strategy could provide new opportunities. Science Comics is a longer-running series that introduce a variety of complex science information and concepts visually and in non-technical terms, so students understand foundational concepts. For the students, the inclusion of both images

and written information would allow the use of multiple modes to represent what they were observing, as well as to work through the process of developing hypotheses. Collecting and reviewing these artifacts from students would be a vital cornerstone of formative assessment for the teacher. This is because they allow for a general impression of what students were perceiving from the subjects being studied and a clear pathway to providing feedback or clarifying misconceptions.

For older students, the use of graphic literature could aid in understanding, analyzing, or creating models. Given that atoms are too small to see in detail without the use of a quantum microscope, atomic structure is typically taught to students using a simplified visual model. One avenue to pursue could be prompting students to understand that this is a model, not an exact representation of what atoms actually look like. The simplicity of the model itself bears similarities to accepted forms of graphic literature. Characters are depicted with simple elegance to be more relatable or convey information more precisely (McCloud, 1994). This analogy could serve as the foundation for critiquing a model like the accepted version of atomic structure, in order to debate whether it could be improved or whether it sufficiently captures the information it is intended to convey.

### ***Mathematics***

Mathematics understanding is indelibly tied to an effective command of certain symbols and the larger language they are part of. Duval (2006) noted that there is frequent tension between mathematical symbols and their referents; as students advance to more complex understandings in mathematics, there may be essentially no clear or tangible referent for students to utilize. Titles such as *Introducing Mathematics: A Graphic Guide* (2015) present a descriptive and applied quality to the concepts presented. This referent represents an important strand of understanding. An example of this would be the frequently baffling concept of an imaginary number, representing the square root of  $-1$ . Although imaginary numbers do have practical value, such as calculations related to electricity, students may respond with confusion or dismissiveness to introducing this form of complex number into a discipline that can condition students for precise or tangible solutions.

Graphic literature in the field of mathematics could serve both descriptive and exploratory purposes when applied to the topic of imaginary numbers. David and Tomaz (2012) stated that the teaching of mathematical content with teacher-led visual aids or instructions does not equate to students developing stronger visualization skills or

deeper understanding of mathematical content. However, visual aids that are more detailed and engaging represent a natural manifestation of what can be presented through graphic literature. One possibility would be to develop and implement instructional materials which use graphic literature as the primary mode for conveying the essential concept and application of imaginary numbers. A richer possibility would be to have students employ graphic literature as a way to explain their understanding of imaginary numbers and the possible uses of these complex numbers. Doing so would provide an opportunity for critical dialogue, problem solving, and formative assessment of students' emerging understanding of a challenging mathematical concept.

### ***Other Subjects***

Much like English and Social Studies, the field of music already has volumes of graphic literature available to serve as texts for exploring crucial content. Ed Piskor's multi-volume Hip-Hop Family Tree series stands as an intersectional work. It is simultaneously a work of storytelling, a historical account, and inextricably linked to a unique form of American popular music. Additionally, Piskor borrowed the design principles of oversized anthologies published by Marvel in the 1970s, which has a foot in both the rich history of graphic literature and the sampling which has been a staple of hip-hop music itself. The opportunities for students to discuss these different Hip-Hop Family Tree elements are numerous. Students might be inspired to embrace the language of graphic literature to create biographies of musicians, compare musical styles, or document the process of composition.

McVicker (2007) endorsed the use of comic strips for teaching literacy skills, particularly the teaching of vocabulary. This utility of the graphic medium presumably extends to acquisition of vocabulary when learning a new language, as students may internalize new vocabulary more effectively when using their native language and images associatively to create a more elaborate and memorable construct. Graphic literature would be a welcome antidote to the often repetitive drills students complete through learning another language. Incorporating graphic literature in the target language for students to read would present many of the possible advantages discussed regarding text comprehension in the section above on English.

Although students certainly need practice hearing and speaking in the target language, rich experience with printed text is essential and can promote more individualized explorations with a new language. Using text and illustrations in tandem could be a practical way for students to practice outside the classroom so that designated instructional time

might be allotted for more structured practice and more exposure to the target language in a social context. Students might also harness graphic literature tools themselves to explore and contrast essential elements of a second language, such as the imperfect and preterit past tenses in Spanish, or even the differences between the indicative and subjunctive moods. Again, this would provide students another mode to engage with complex concepts, while directly fulfilling content area standards like Comparisons and Connections as outlined by the American Council on the Teaching of Foreign Languages.

### **An Instructional Structure**

For the teacher who would utilize graphic novels with this form of pedagogy, the assessment and support framework become crucial. While any assessment structure's purpose is to add value to the other learning experience, it is equally easy to 'get lost in the weeds' with regard to evaluation and assessment. A more productive approach to this instructional component would be to focus on the exercise or experience goals. In this, Wiggins and McTigue's (2005) framework of Understanding by Design (UBD) presents such a desirable approach. Within this approach, the utility of backward design serves this purpose well. Teachers focusing on this form of instructional planning will look to their goals for presenting the graphic novel or other work. From this, planning backwards means that one must more fully examine the ways that aesthetic learning (i.e. graphic works) and subject matter intersect with each other. In doing this, the teacher will find natural connection or bridging points between both bodies of information (i.e., the textbook v. graphic materials).

Focusing on a smaller number of broader, but more interwoven concepts will connect greater areas of understanding. The essential questions of UBD provide a natural place from which to build and support critical thinking. The nature of critical understanding means that there is extensive communication and interaction between members of the class or learning setting. This mutually constructed process brings about the necessity of asking further questions, thus the group draws strength from within itself.

Regardless of the academic subject, teachers utilizing graphic materials would be wise to approach this from an aesthetic perspective, not strictly informational. Through an aesthetic perspective, the teacher is free to set any manner of holistic goals for the results of the exercise. These holistic or other goals may certainly mirror or be drawn from existing educational standards. It is important to note that these two are not exclusive of one another.



The use of descriptive rubrics for discussion, peer evaluation, Socratic discussion, and media use in the formative part of the process. Discussion like these can and should involve the students in better understanding the varying elements of a message and what they are looking for. This is an important component of modern literacy, given the image-rich culture we live in.

### Conclusion

The process and experience of visual literacy are much more complicated and multidimensional for the value that people place on it. The subjects a student learns in school should be commensurate with the kinds of everyday media experiences and imagery they encounter across their lives. The nature of studying and understanding artistic representation and intent presents an interpretive exercise for the intention behind any message. This represents a deeper level of learning and understanding, and that is the goal. Combining the rigor of academic study with an appreciation for the impact of the aesthetic. Aesthetics and imagery permeate most aspects of the daily lives of students. Graphic instructional pedagogy represents a means to teaching and learning that may not lie on the usual instructional path across schools, but all the resources needed for this expansive form of critical literacy and understanding are already in schools. They need only be collected, organized, and executed.

### References

- Acuff, J. B. (2015). Failure to operationalize: Investing in critical multicultural art education. *The Journal of Social Theory in Art Education (Online)*, 35, 30-43. Retrieved from <http://proxeast.uits.iu.edu/login?url=https://search-proquest-com.proxeast.uits.iu.edu/docview/1715675895?accountid=11648>
- Adams, J. (2012). Make learning matter for the multitasking generation. *Middle School Journal*, 43(3), 6-12. Retrieved from doi: <https://doi.org/10.1080/00940771.2012.11461806>
- Bannert, M. (2002). Commentary: Managing cognitive load: recent trends in cognitive load theory. *Learning and Instruction*, 12(1), 139-146.
- Benson, K. (2016). Graphic novel histories: Women's organized resistance to slum clearance in crossroads, south africa, 1975-2015. *African Studies Review*, 59(1), 199-214. doi:<http://dx.doi.org.proxeast.uits.iu.edu/10.1017/asr.2016.10>
- Boatright, M. D. (2010). Graphic journeys: Graphic novels' representations of immigrant experiences. *Journal of Adolescent & Adult Literacy*, 53(6), 468-476. doi: <http://dx.doi.org.proxeast.uits.iu.edu/10.1598/JAAL.53.6.3>
- Boerman-Cornell, B. (2013). More than comic books. *Educational Leadership*, 70(6), 73-77. Retrieved from <http://www.ascd.org/publications/educational->

- leadership/mar13/vol70/num06/More-Than-Comic-Books.aspx
- Boerman-Cornell, W. (2015). Using historical graphic novels in high school history classes: Potential for contextualization, sourcing, and corroborating. *The History Teacher*, 48(2), 209-224. Retrieved from <http://www.jstor.org/stable/43264401>
- Brenna, B. (2013). How graphic novels support reading comprehension strategy development in children. *Literacy*, 47(2), 88-94. <https://doi.org/10.1111/j.1741-4369.2011.00655.x>
- Broome, J., Pereira, A., & Anderson, T. (2018). Critical thinking: Art criticism as a tool for analysing and evaluating art, instructional practice and social justice issues. *International Journal of Art & Design Education*, 37, 265-276. <https://doi.org/10.1111/jade.12111>
- Calo, K. M. (2011). Comprehending, composing, and celebrating graphic poetry. *The Reading Teacher*, 64(5), 351-357. Doi: <https://doi.org/10.1598/RT.64.5.6>
- Campbell, L. H. (2011). Holistic art education: A transformative approach to teaching art. *Art Education*, 64(2), 18-24. Doi: <https://doi.org/10.1080/00043125.2011.11519116>
- Chute, H. (2008). Comics as literature? Reading graphic narrative. *PMLA*, 123(2), 452-465. doi: <https://doi.org/10.1632/pmla.2008.123.2.452>
- Connors, S. P. (2015). Expanding students' analytical frameworks through the study of graphic novels. *Journal of Children's Literature*, 41(2), 5-15. Retrieved from <http://proxyeast.uits.iu.edu/login?url=https://search-proquest-com.proxyeast.uits.iu.edu/docview/1734735898?accountid=11648>
- David, M. M., & Tomaz, V. S. (2012). The role of visual representations for structuring classroom mathematical activity. *Educational Studies in Mathematics*, 80(3), 413-431. Doi: <https://doi.org/10.1007/s10649-011-9358-6>
- Dallacqua, A. K. (2012). Exploring literary devices in graphic novels. *Language Arts*, 89(6), 365-378. Retrieved from <http://proxyeast.uits.iu.edu/login?url=https://search-proquest-com.proxyeast.uits.iu.edu/docview/1022627004?accountid=11648>
- Dallacqua, A. K. (2018). "When I write, I picture it in my head": Graphic narratives as inspiration for multimodal compositions. *Language Arts*, 95(5), 273-286. Retrieved from <http://proxyeast.uits.iu.edu/login?url=https://search-proquest-com.proxyeast.uits.iu.edu/docview/2036727517?accountid=11648>
- Delacruz, E. M., & Dunn, P. C. (1996). The evolution of discipline-based art education. *The Journal of Aesthetic Education*, 30(3), 67-82. Doi: <https://doi.org/10.2307/3333322>
- Duncan, R., Smith, M., & Levitz, P. (2015). *The power of comics: History, form, and culture* (2nd ed.). London, UK: Bloomsbury. doi: 10.5860/choice.47-4236
- Duron, R., Limbach, B., & Waugh, W. (2006). Critical thinking framework for any discipline. *International Journal of Teaching and Learning in Higher Education*, 17(2), 160-166.
- Duval, R. (2006). A cognitive analysis of problems of comprehension in a learning of mathematics. *Educational Studies in Mathematics*, 61, 103-131. Doi: <https://doi.org/10.1007/s10649-006-0400-z>
- Elder, L., & Paul, R. (1994, Fall). Critical thinking: Why we must transform our teaching. *Journal of Developmental Education*, 18(1), 34-35.

- Goodwin, M. (2012). *Economix : How and why our economy works (and doesn't work) in words and pictures*. New York, NY: Abrams ComicArts.
- Gregory, L., & Higgins, S. (2017). Critical information literacy in practice: A bibliographic review essay of critical information literacy, critical library pedagogy handbook, and critical literacy for information professionals. *Communications in Information Literacy*, 11(2), 390-403. Retrieved from <http://proxyeast.uits.iu.edu/login?url=https://search-proquest-com.proxyeast.uits.iu.edu/docview/1990799342?accountid=11648>
- Gude, O. (2007). Principles of possibility: Considerations for a 21st-Century art & culture curriculum. *Art Education*, 60(1), 6-17. Doi: <https://doi.org/10.180/00043125.2007.11651621>
- Guthrie, J. T., & Wigfield, A. (1999). How motivation fits into a science of reading. *Scientific Studies of Reading*, 3(3), 199-205.
- Hamblen, K. A. (1984). An art criticism questioning strategy within the framework of Bloom's taxonomy. *Studies in Art Education*, 26, 41- 50. doi:10.2307/1320799.
- Hassett, D., & Schieble, M. (2007). Finding space and time for the visual in K-12 literacy instruction. *The English Journal*, 97(1), 62-68. doi:10.2307/30047210
- Hii, S. C., & Fong, S. F. O. O. K. (2013). Effects of multimedia-based graphic novel presentation on critical thinking among students of different learning approaches. *TOJET: The Turkish Online Journal of Educational Technology*, 12(4) Retrieved from <http://proxyeast.uits.iu.edu/login?url=https://search-proquest-com.proxyeast.uits.iu.edu/docview/1492503337?accountid=11648>
- Irwin, K. (2014). Graphic nonfiction: A survey of nonfiction comics. *Collection Building*, 33(4), 106-120. <https://doi.org/10.1108/CB-07-2014-0037>.
- Jacobs, D. (2007). More than words: Comics as a means of teaching multiple literacies. *The English Journal*, 96(3), 19-25. doi:10.2307/30047289
- Jacobs, K. B., & Low, D. E. (2017). Critical questioning in and beyond the margins: Teacher preparation students' multimodal inquiries into literacy assessment. *English Education*, 49(3), 226-264. Retrieved from <http://proxyeast.uits.iu.edu/login?url=https://search-proquest-com.proxyeast.uits.iu.edu/docview/1884771737?accountid=11648>
- Lemoni, R., Lefkaditou, A., Stamou, A., Schizas, D., & Stamou, G. (2013). Views of nature and human-nature relations: An analysis of pictures' visual syntax about the environment in Greek primary school textbooks-diachronic considerations. *Research in Science Education*, 43(1), 117-140.
- McCloud, S. (1994). *Understanding comics: The invisible art*. New York, NY: Harper Perennial.
- McVicker, C. J. (2007). Comic strips as a text structure for learning to read. *The Reading Teacher*, 61(1), 85-88. Doi: <https://doi.org/10.1598/RT.61.1.9>.
- Michell, M. (2006). Teaching for critical literacy: An ongoing necessity to look deeper and beyond. *The English Journal*, 96(2), 41-46. doi:10.2307/30047126
- Milbrandt, M. K., Felts, J., Richards, B., & Abghari, N. (2004). Teaching-to-learn: A constructivist approach to shared responsibility. *Art Education*, 57(5), 19-24,33.
- Möller, K.,J. (2016). Engaging middle-grades readers through graphic nonfiction trade books: A critical perspective on selected titles recommended for

- classroom use. *Journal of Children's Literature*, 42(1), 63-70. Retrieved from <http://proxyeast.uits.iu.edu/login?url=https://search-proquest-com.proxyeast.uits.iu.edu/docview/1837539369?accountid=11648>
- Nappi, J. S. (2017). The importance of questioning in developing critical thinking skills. *Delta Kappa Gamma Bulletin*, 84(1), 30-41. Retrieved from <http://proxyeast.uits.iu.edu/login?url=https://search-proquest-com.proxyeast.uits.iu.edu/docview/1942155616?accountid=11648>
- Öner, S. (2017). The effect of a selected graphic novel on reading comprehension. *International Journal of Arts & Sciences*, 10(2), 525-539. Retrieved from <http://proxyeast.uits.iu.edu/login?url=https://search-proquest-com.proxyeast.uits.iu.edu/docview/2057337804?accountid=11648>
- Radoff, J., Goldberg, F., Hammer, D. & Fargason, S. (2010). The beginnings of energy in third graders' reasoning. In C. Singh, M. Sabella & S. Rebello (eds) *2010 Physics Education Research Conference* (pp. 269-272). Portland OR: American Institute of Physics. Doi: <https://doi.org/10.1063/1.3515220>
- Rashid, S., & Qaisar, S. (2016). Developing critical thinking through questioning strategy among fourth grade students. *Bulletin of Education and Research*, 38(2) Retrieved from <http://proxyeast.uits.iu.edu/login?url=https://search-proquest-com.proxyeast.uits.iu.edu/docview/1878767121?accountid=11648>
- Sardar, Z., Ravetz, J., Van Loon, B. (2015). *Introducing mathematics: A graphic guide* (4th ed). London, UK: Icon Books.
- Schieble, M. (2014). Reading images in "American Born Chinese" through critical visual literacy. *The English Journal*, 103(5), 47-52. Retrieved from <http://www.jstor.org/stable/24484245>
- Schwarz, G. (2010). Graphic novels, new literacies, and good old social justice. *ALAN Review*, 37(3), 71-75. Doi: <https://doi.org/10.21061/alan.v37i3.a.10>
- Smetana, L., & Grisham, D. L. (2012). Revitalizing Tier 2 intervention with graphic novels. *Reading Horizons: A Journal of Literacy and Language Arts*, 51 (3). Retrieved from [https://scholarworks.wmich.edu/reading\\_horizons/vol51/iss3/3](https://scholarworks.wmich.edu/reading_horizons/vol51/iss3/3)
- Smith, P. L., Goodmon, L. B., Howard, J. R., Hancock, R., Hartzell, K. A., & Hilbert, S. E. (2019) Graphic novelisation effects on recognition abilities in students with dyslexia, *Journal of Graphic Novels and Comics*. DOI: 10.1080/21504857.2019.1635175'
- Sparks, S. D. (2015). Researchers target ways to design better mathematics text materials. *Education Week*, 34(29), 8.
- Sweller, J. (2005). Implications of Cognitive Load Theory for multimedia learning. In R. E. Mayer (Ed.), *The Cambridge handbook of multimedia learning* (pp. 19–30). Cambridge, UK: Cambridge University Press. <https://doi.org/10.1017/CBO9780511816819.003>
- Wang, S. (2017). An exploration into research on critical thinking and its cultivation: An overview. *Theory and Practice in Language Studies*, 7(12), 1266-1280. doi:<http://dx.doi.org.proxyeast.uits.iu.edu/10.17507/tpls.0712.14>
- Wiggins, G., & McTigue, G. (2005). *Understanding by design*. Alexandria, VA: Association for Supervision and Curriculum Development.
- Wilson, B. (2014). Teach the how: Critical lenses and critical literacy. *The English Journal*, 103(4), 68-75. Retrieved from <http://www.jstor.org/stable/24484223>