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# Learning to Teach

Language Arts, Mathematics,  
Science, and Social Studies  
*Through Research and Practice*

## **Editors in Chief**

Jenny Denyer, Ph.D.

Rebecca M. Schneider, Ph.D.

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A publication of the Department of Curriculum and Instruction  
Rebecca M. Schneider, Chair | The University of Toledo



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## Language Arts, Mathematics, Science, and Social Studies *Through Research and Practice*

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<b>Editors in Chief:</b>	Jenny Denyer, Ph.D. Rebecca M. Schneider, Ph.D.
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# Language Arts

# Do You Know I(nformational) T(ext) When You See It? Towards a Workable Definition of Informational Text

Kevin O'Connor

**Abstract:** Scholars have noted that schools use very little informational text in instruction. This scholarship intersected with the movement to establish common learning standards for the English language arts. One of the results of this confluence is that the Common Core State Standards and, in turn, Ohio's English language arts learning standards require that a "significant amount" of informational text be used in instruction. Unfortunately, there is confusion about what sort of texts are considered to be informational texts. Practicing English language arts teachers would be greatly assisted by a reliable and understandable definition of informational text. This practitioner's definition should focus on texts that have the purpose to explain, inform, or persuade.

## Introduction

*In 1964, the United States Supreme Court was faced with the question of whether a French film shown at a Cleveland Heights, Ohio theater was obscene and therefore not entitled to the protection of free expression that is guaranteed by the United States Constitution. Justice Potter Stewart concluded that the film was not obscene and that criminal obscenity laws could be applied only to "hard core pornography." In explaining his conclusion Justice Potter wrote, "I shall not today attempt further to define the kinds of material I understand to be embraced within that shorthand description, and perhaps I could never succeed in intelligibly doing so. But I know it when I see it." (Jacobellis v. Ohio, 1964)*

Nell K. Duke (2000) published what became the landmark journal article concerning the lack of informational text in American classrooms. In her article, Duke provided a definition of informational text which included a list of the common features of informational text, a division of informational text into three categories, and an explanation of her definition's rationale. At the conclusion of her explanation, Duke (2000) wrote, "as difficult as it may be to define informational text rigidly or absolutely, we know it when we see (and don't see) it" (p. 206).

Pornography and informational text make strange and unlikely bedfellows but both types of material are difficult to intelligently and absolutely define. Pornography's definitional woes are not an educator's concern, but informational text's definitional elusiveness poses a real dilemma for an Ohio English language arts (ELA) teacher. Ohio's ELA learning standards "demand that a significant amount of reading of informational text" take place (Ohio Department of Education, 2010, p. 4). Despite this demand, the Ohio standards do not specifically define informational text. Scholars, meanwhile, have provided myriad definitions and descriptions of informational text, but these efforts have "resulted in much confusion" (Moss, 2013, p. 11). This has left practicing ELA teachers to assume what informational text is



(Watkins & Liang, 2014). The lack of clarity is so great that some scholars have encouraged “practitioners to ask those encouraging them to use more informational text in their literacy or content area programs to begin the discussion by asking what is meant by informational text” (Saul & Dieckman, 2005, p. 505). Rather than giving practitioners a reliable definition of informational text so they will know it when they see it, the standards and scholars have inadvertently created an unhelpful loop. The standards and, in turn, school districts expect ELA teachers to use more informational text in the classroom, which is already ill-defined, and then guess what texts should be used to satisfy the demand for “a significant amount” of informational text. ELA teachers should not be left to wonder if their “know it when I see it” determinations are on target. Instead, ELA teachers should have a readily understandable, workable guide to identifying an appropriate informational text.

## Teachers and Recognizing Informational Text

The Ohio state standards require that more informational text be used in the classroom so Ohio ELA teachers need to know informational texts when they see it. Ohio’s ELA learning standards, adopted in June, 2010, follow the Common Core State Standards Initiative (CCSS) push to use a greater amount of informational text in instruction in the ELA. With the research regarding the paucity of informational text in classrooms well established (Duke, 2000), Ohio’s standards operate from the perspective that, “[s]tudents must be immersed in information about the world around them if they are to develop the strong general knowledge and vocabulary they need to become successful readers and be prepared for college, career, and life. Informational texts play an important part in building students’ content knowledge” (Common Core State Standards initiative, 2010, “Building knowledge,” para. 1). The introduction to Ohio’s Learning Standards (Ohio Department of Education, 2010) for the ELA further explains the argument for the push to use more informational text:

Part of the motivation behind the interdisciplinary approach to literacy promulgated by the Standards is extensive research establishing the need for college and career ready students to be proficient in reading complex informational text independently in a variety of content areas. Most of the required reading in college and workforce training programs is informational in structure and challenging in content; postsecondary education programs typically provide students with both a higher volume of such reading than is generally required in K–12 schools and comparatively little scaffolding. The Standards are not alone in calling for a special emphasis on informational text. The 2009 reading framework of the National Assessment of Educational Progress (NAEP) requires a high and increasing proportion of informational text on its assessment as students advance through the grades. (p. 4-5)

Standards-writers and scholars have confidence that a significant increase in the use of informational text will help students be better prepared for college or career and have the literacy skills needed in the twenty-first century. If educators are to use informational text in instruction, they need to know what types of text fall under that umbrella description. Unfortunately, there is no consensus on what material

should be considered informational text, a condition which makes it difficult for an ELA teacher to know if her instruction is consistent with the standards' expectations or, in practical terms, be able to explain to an administrator how her instruction is consistent with the standards.

## What are Informational Texts?

Over the years, scholars and standards writers have described informational text in different ways, from confining informational text to the very narrow category of procedural "how to" texts to broadly equating informational text with all non-fiction. The most relevant place to start to try to gain an understanding of how informational text is defined is the most influential article written on informational text: Duke (2000) seminal article about the scarcity of informational text in the classroom.

### *Duke's Original Definition of Informational Text*

Duke (2000) conducted a study with the research goal of addressing "the dearth of knowledge about students' experiences with informational texts in early grades" (p. 205). She chose this goal because of the "few data about the extent to which informational texts are actually included in the early grade classrooms" (p.205). The results of her study provided "empirical confirmation of the suspected paucity of informational texts in the early grades" (p. 220).

To conduct a study about student experience with informational text, Duke (2000) had to begin by defining what she meant by "informational text." She defined informational text as texts having many or all of nine features:

- (1) a function to communicate information about the natural or social world, from one presumed to have more knowledge on the subject to one presumed to be less knowledgeable; (2) an expectation of durable factual content; (3) timeless verb constructions; (4) generic noun constructions; (5) technical vocabulary; (6) classificatory and definitional material; (7) text structures such as compare/contrast, cause/effect or problem/solution; (8) reputation of topical theme; and (9) graphical elements such as diagrams, maps, indices. (p. 205)

With these nine defining features in mind, Duke (2000) went on to divide informational text into three types: informational (essentially expository text), narrative-informational (information conveyed through a story structure), and informational-poetic (information conveyed through the structure of a poem). She explained her definitional approach by arguing that it attends to both a text's purpose and its linguistic features. The list of nine text features was helpful for her as she conducted her study on the experience with informational text in the early grades, but it is not a definition that a practitioner can readily apply when deciding what text to use in the classroom. In later writing, Duke (2004) simplified her description of informational text to focus on the first of her nine features: texts that convey information about the natural or social world.

### ***Duke's Influential Definition Undergoes Revision***

Duke and Tower (2004) further honed Duke (2000) definition by dropping the categories of informational-narrative and informational-poetic from inclusion as informational text and excluding certain types of nonfiction from the informational text tent. In writing about texts for young readers, Duke and Tower (2004) considered only one type of nonfiction to be informational text and that is text that explains information about the natural or social world, a definition which borrows from the first of Duke's previous list of nine features of informational text. Duke and Tower (2004) exclude biographies, procedural texts, and reference materials from the informational text umbrella. This revised definition greatly reduces the scope of informational text. Standards-writers and other educational policy wonks, however, did not go along with this restrictive view.

### **Standards Writers and Other Educational Policy Makers**

Ohio's ELA standards are based on the CCSS and refer in the introduction and the standards themselves to "informational text." No specific definition is provided, but clues are dropped. The introduction, for example, informs the educator that "fulfilling the standards for 6-12 ELA requires much greater attention to a specific category of informational text - literary nonfiction - than has been traditional" (Ohio Department of Education, 2010, p. 5). Further, in a table designed to illustrate the range of text types for student reading in grades six through 12, Ohio's standards list the following types of text under a heading of informational text: "exposition, argument, and functional text in the form of personal essays, speeches, opinion pieces, essays about art or literature, biographies, memoirs, journalism, and historical, scientific, technical, or economic accounts (including digital sources) written for a broad audience" (ODE, 2010, p. 68). With this list, the ELA teacher in Ohio has some idea about what can be used as informational text but this list includes mostly nonfiction and is a departure from the definition of informational text most commonly cited in scholarship.

In addition, the standards also swerve from the definition of informational texts provided by one of its biggest influences. The thinking behind the standards was shaped, at least in part, by the National Assessment of Education Progress (NAEP) and its 2009 Report Card on Reading. The NAEP (2009) reading framework divides the reading world into informational texts and literary texts. Informational texts can be categorized as "exposition, argumentation and persuasive text, and procedural text and documents" (NAEP, 2009, p. 4). Their definition focuses on the purpose of a text more than text feature. The result of its categorization does not include literary nonfiction as informational text, but does include procedural texts. The standards refer to literary nonfiction as a type of informational text and both Duke (2004) and the NAEP (2009) would exclude such text from the informational text family. Neither of two major influences on the standards were faithfully followed on the question of what texts are included in the category of informational texts. This conflict among authoritative sources about the definition of informational text can easily leave practitioners in a state of uncertainty when they attempt to meet the demand to increase the use of informational text.

## Can Other Scholars Help Resolve the Confusion?

Other scholars remain confounded by this foundational question when they study some aspect of informational text. Maloch and Bomer (2013) note that “informational text is a common term but it can be confusing” (p. 207). They describe a landscape in which some define informational text as nonfiction while others divide nonfiction into different categories with informational text only one slice of that five slice pie. Part of the scholarly mess around pinning a definition on informational text is that scholars focus on different aspects of text to help them decide how to characterize text. Some scholars focus on a text’s purpose, others on a text’s features or structure. These types of categorization strategies lead to sub-categories of informational text such as “nonnarrative-informational text, expository-informational text, and dual purpose texts” (Maloch & Bomer, 2013, p. 208). Saul and Dieckman (2005) found a similar stew of definitions of informational text and concluded that practicing teachers should press for specific answers about what texts are meant to be included under the umbrella term, informational text. Finally, Watkins and Liang (2014) express concern that “many teachers are unaware that differences in definitions even exist [and that] teachers may also assume that including more informational text in their classrooms simply means including more nonfiction” (p. 679). Watkins and Liang (2014) conclude that “a unified definition and consistency in its use will ultimately aid teachers in better helping students develop the large toolbox of skills and strategies they need when reading and writing for information” (p. 680).

## A workable definition of information text for teachers

Ohio ELA teachers should have reliable guidance on what qualifies as informational text both to satisfy the demands of Ohio’s ELA learning standards and provide their students with exposure to a variety of texts to prepare them for what they will see in college and in the workforce. Informational text should be considered any text the purpose of which is to explain, inform, or persuade. This must include text found in print or digital format. A special emphasis needs to be placed on the digital formats given the world’s incomplete but steady move to the digital and the internet’s heavy lean toward text that explains, informs, or persuades as opposed to literary text. Texts that explain or inform may concern history, science, technical matters, or even procedural text that explains how to accomplish some task. These procedural texts should be included since such texts are precisely the kind often encountered in the workforce. Text intended to persuade also may include essays or speeches focusing on different forms of journalism. Given Ohio’s standards, literary nonfiction, which is often the political football in debates about what is or is not informational text, must be included. To have confidence that teachers know it when they see it, when selecting text to use as informational text, Ohio ELA teachers should ask themselves whether the text’s purpose is to explain, inform, or persuade. If so, proceed with confidence.

## Conclusion

Scholars have pointed out the traditional absence of informational text from the ELA classroom and have provided a rationale for its inclusion. However, they have not delivered educators with a consensus, easy to grasp definition of informational text. A definition with a focus on the purpose of a text and whether that purpose is to explain, inform, or persuade would help ELA teachers identify informational text to use in the classroom, allow their students to benefit from the use of informational text, and meet the exceptions of Ohio's ELA learning standards.

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### About the Author

Kevin O'Connor received a Bachelor of Arts degree in English from the University of Notre Dame in 1991 and a Juris Doctor degree from the University of Toledo College of Law in 1993. After practicing law for 21 years, Kevin returned to the University of Toledo to earn a Master of Education degree. From his experience in law, Kevin understands the power of words and will be teaching American Literature and AP Language and Composition at Anthony

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# In Defense of Young Adult Literature

Marc C. Driscoll

**Abstract:** English language arts teachers have forever relied on the English literature canon for their selection of text to use in the classroom. This article asks the question if this method is the most effective way to choose classroom texts based on the interest level of the students. It is argued that young adult literature, or literature that is written about characters that are the same age as students facing similar issues, can capture the interest of students and motivate them to be engaged in the English language arts lessons.

## Introduction

Traveling Mexico to find a buyer for the largest pearl in the world, struggling to maintain a love affair amidst a long-standing family quarrel, facing shame of the community due to an adulterous red letter; these are the events that middle school students face today. If you feel that this is off base consult the curriculum or pacing guide of a typical English language arts classroom in the middle school setting. The events listed above can be found in the various novels and stories that students are asked to read in their middle school English language arts (ELA) classrooms. The problem is, just as you were unable to believe that these were the events that middle school students are facing today, middle school students also struggle to make connections with characters, plots, and settings that do not reflect their surroundings and who they are. When middle school teachers rely too heavily on the works of the English literary canon like *The Pearl*, *Romeo and Juliet*, or *The Scarlet Letter* that students cannot relate to, the interest in literature is lost. So then, what needs to be done? It is time for these educators to begin embracing texts that reflect the student experience, texts that paint a picture of what it means to be a middle school student today.

ELA teachers need look no further than young adult literature. That is, literature that is written for the specific audience of pre-teen to teenage audience, literature in which the main characters are teenagers who are experiencing many of the same trials and tribulations that young adults do today. It can be readily argued that young adult literature can be used effectively to engage students in the middle grades in the lessons of the ELA classroom.

## Why the English Literacy Canon

Teachers of the ELA rely on the English literary canon for their selection of texts to use in the classroom because these texts are texts that have stood the test of time. Scholars and critics have praised these texts for their high level of literary merit and quality. The texts of the English canon have created a standard for judgment of what valuable reading is, and therefore many believe that this valuable reading must be invoked in the classroom. Because these texts have been traditionally taught in the English classroom, they can be relied upon to effectively teach the nuances, structure, themes and lessons of text that students must learn in the classroom. That

is to say, there is no question as to their value in lesson planning (Landow, 1989). It is not difficult to name texts that are included in the English canon. It includes such familiar readings as: *To Kill a Mockingbird*, *The Great Gatsby*, *Lord of the Flies*, *Hamlet*, and *Of Mice and Men*. The worth of these works is heralded at the instant that their name is invoked, the trouble is that the stories that each of these novels tell simply does not grab the attention of students who are not interested in reading.

## Young Adult Literature as Relevant Literature

As easy as it is to name the works in the English literary canon, it is equally difficult for an author or a text to be accepted in to the canon. Works are rejected simply for their genre, their subject matter, their audience, and their age. And so, many educators exclude using various works in the classroom because previous scholars and critics have determined that these works are not fit to be included in the list of the greatest works of all time. This exclusionary process of classroom text selection is done at the expense of young adult literature.

When looking for a basis from which to select young adult literature it can be said that young adult literature includes, “texts in which teenagers are the main characters dealing with issues to which teens can relate” (Glaus, 2014, p. 408). It is important to understand this definition because it highlights what is missing from many of the classics of the canon. Young adult literature speaks to middle school students because the characters reflect the personalities and characteristics of the students, the settings reflect the world in which students live, and the plot reflects the issues that pre-teens and teenagers are struggling with today. This is something that the English literary canon falls short of accomplishing.

Young adult literature’s strength in the classroom setting lies in its relevance to the student experience. The characters in these texts are working through issues that most teenagers face today such as emerging identities, cultural acceptance, and cognitive development. For example, the novel *Thirteen Reasons Why* by Jay Asher (2007) challenges young adults to think about the effects of bullying of students their age. It asks students to consider how deeply people can be hurt by words, and what it means for a young student to commit suicide.

Young adult literature is also more relevant to students because most pieces of young adult literature have been written about time periods that students have either lived through or are familiar with. Glaus (2014) surveyed the suggested reading list of the National Governor’s Association Center for Best Practices and Council of Chief State School Officers (largely influenced by the canon) and found that the median publication date of the texts was 1915, nearly 100 years removed from today. Naturally, students can connect with young adult literature more readily because it is written about events with which they are familiar (Glaus, 2014; Ivey & Johnston, 2013). Students are disconnected to stories about history to which they are not related such as in the writings of Shakespeare. Instead, students prefer to read about characters who are living in their time period.



## Engagement with Young Adult Literature

The relevance of young adult literature to the student experience is important because it has been noted that students find the elements of these texts to be particularly engaging (Henderson & Buskist 2011). Guthrie and Wigfield (2000) explain that engaged readers as those who are, “motivated to read, strategic in their approaches to comprehending what they read knowledgeable in their construction of meaning and socially interactive while reading” (p. 602). Guthrie, Wigfield, and You (2012) continue to explain that engagement in reading is crucial to developing reading comprehension skills and furthering reading achievement.

According to Bull (2011) engagement in reading can be identified when students are able to make intertextual connections. Students show their comprehension of a text when they can relate the elements of text to other texts they have read, their personal experiences, the world around them, and the text itself. Intertextual connections allow students to connect “with text in meaningful and personal ways... to develop interest and comprehend at deeper levels” (Bull, 2011, p. 224). Intertextual connections allow for meaningful reading because these connections ask a reader to reflect upon their reading, question the ideas of the text, and draw on personal knowledge to make conclusions.

A key factor to engaging in learning using intertextual connections is using background knowledge and personal stories for example. This is where the success of young adult literature lies. Students are more apt to be engaged in the reading process through young adult literature because they are experiencing the same events and circumstances that the characters in these novels are. It is easier to believe that a student has dealt with or is dealing with bullying as Jerry Renault does in *The Chocolate War*, than to believe that a student is wondering who in his community is a witch as the characters do in *The Crucible*. Allowing students to enter discussion in the classroom about text using experiences from their lives means engaging them in more thoughtful reading practices (Bull, 2011).

## Young Adult Literature and the Standards

The National Council of Teachers of English (NCTE) has published the standards that they feel must be met for students to achieve the highest level of ELA education. It is these standards that ELA teachers strive to achieve in the education of their students. These standards too, cite the importance of engagement with text and the ability for students to make intertextual connections in order to create deeper meaning of the reading that they are doing. Due to the fact that students are able to engage with young adult literature on a deeper level and more readily provide intertextual connections, teachers can rely on young adult literature for lesson planning toward meeting this standard (Henderson & Buskist, 2011).

NCTE reading standards also call for students to read a wide range of text in order to build a deeper understanding of themselves and the world around them. The easily relatable characters and plot in young adult literature help students form a more applicable sense of self while the modern nature of the writing of many young adult literature texts aids students in the development of understanding of their world (Glaus, 2014, p. 410). Finally, the reading standards call for the reading



of a wide variety of texts from many different genres and time periods in order to build a greater understanding of the human experience. Limiting classroom text selection limits the student's scope of the human experience. In order to fully meet the reading standards, it is incumbent upon ELA instructors to find appropriate young adult texts for their students to learn and grow.

## **Bridging the Gap to English Literature Canon**

Accepting young adult literature into the curriculum in the middle grades classroom does not mean a full rejection of the traditional works of the English literary canon. There is merit to the canon; the themes of its novels and the profound writing of many of its authors are bound to impact students' educational careers on multiple levels. It is for this reason that students must be given a vehicle to arrive at a reading level at which they are ready to approach the readings of the canon. There is no doubt that this vehicle can be young adult literature.

Motivating students to read is a key factor in engaging students in the reading process and the lessons of the English language arts classroom. In fact, motivation and engagement work in tandem. That is to say that if a student is engaged in the literature that he is reading then he is apt to be motivated to perform the reading that is requested of him. This is one of the primary goals of using young adult literature in the classroom, motivating students to read, to enter into the community of readers. Once students find that they enjoy reading through the use of young adult literature, educators can ask them to progress to more traditional works of the canon. Glaus (2014) states, "young adult literature does not have to be seen as competition with the classics; rather it is an important tool for establishing reading lives of students and creating an appreciation for literature (p. 414)." This appreciation for literature allows students to begin to enter the realm of reading more challenging and complex texts in different genres.

## **Conclusion**

Susan Ohanian (1981) posts in her writing that ELA teachers must think about why they want their students to read. She believes that it is our goal as English educators to excite our students about reading. She acknowledges the struggle with finding appropriate text in the classroom, but notes that there are "exciting choices in between John Travolta and William Wordsworth" (Ohanian, 1981, p. 30). Young adult literature can be that middle ground, it can be the literature that is used in the classroom that will excite young students about reading and encourage students to continue to engage in the reading process. The burden is evident, and it is one that teachers may be reluctant to face. It is our responsibility as educators to seek out these interesting texts instead of relying on the English literature canon to tell us what to teach in our classroom. There is no doubt that there are fine writers of young adult literature out there who are penning works that students will find relevant, engaging, and worthwhile. Thus, it is worthwhile for educators to use these texts for lessons in their classroom and for educators to encourage their districts to provide this literature. The time has come ELA educators to ask themselves the

question, “Is it what my students are reading that matters most or that my students are reading that matters most?”

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Marc Driscoll received a Bachelor of Arts in communication from The University of Toledo in 2008. He has since acquired his Master of Education and is teaching sixth grade English at Springboro Intermediate School in Springboro, Ohio. Marc is interested in promoting the use of relevant coursework in the classroom.

# Don't Skirt the Subject

## Using Canonical Texts as Opportunities for Race Discussion

Emily Gardner

**Abstract:** While administrators, parents, and scholars across the nation ceaselessly debate the issue of whether or not racially challenging texts, such as *Adventures of Huckleberry Finn*, *To Kill a Mockingbird*, and *Heart of Darkness*, should be included in English language arts curriculum, many English teachers are left to teach these controversial texts with often insufficient training in how to utilize them in their classrooms. It is the responsibility of teachers to help students become empathetic citizens by developing the skills necessary to navigate through a racially diverse world. Therefore, teachers ought to use texts containing racism as opportunities to open a conversation of race relations both in the past and present time, by using research-based methods, like those in this article.

### Introduction

A first year teacher welcomes students into her new classroom during the first week of school. Once the bell rings, the teacher addresses the class and informs them they will be reading a novel for the next few weeks. Copies of *Adventures of Huckleberry Finn* are stacked on her desk, but before calling students over to sign out copies, she looks out into the class and judges what the students' responses will be. The classroom contains twenty students, twelve black, two Hispanic, and six white. As she nervously looks out at her students, the young white teacher, has several thoughts racing through her head. "Should I say 'nigger' when I'm reading? How would the principal react to hearing that I used that word? Would he support my choice? Should I ask the students when they heard the word, or will that bring up bad memories? Should we begin with the lesson on satire or the lesson on a history of the controversy? Should I just ask to teach *My Antonia* instead?"

This teacher is experiencing what many new and experienced teachers alike go through while teaching a racially challenging text which is a lack of confidence in their educational choices. Just like learning how to best differentiate instruction or challenge high achieving students, learning how to teach texts containing racism in a way that challenges students to think about race is an essential skill for English language arts teachers, but one that many do not receive training in. As a result, many teachers are left feeling like the example above, unconfident and questioning their instructional choices. Regardless of whether or not teachers are proponents of keeping texts like *Huckleberry Finn* in the classroom, the fact is they are there, and teachers have to figure out the most productive way to discuss them.

If schools seek to produce productive members of society, which our democratic government-funded public school system seems to suggest, students must know how to communicate with each other, a skill that includes the ability and willingness to understand others' perspectives. What this comes down to is a call

for discourse on societal issues, such as gender, class, and, for the purposes of this article, race relations. While I argue it is a role of teachers of all subjects to address issues like these, this article focuses on addressing race relations in the English language arts (ELA) classroom. Because texts like *Adventures of Huckleberry Finn*, *To Kill a Mockingbird*, and *Heart of Darkness*, are staples in ELA curriculum in schools across the nation, teachers and their students are already confronting the topic of race in their classrooms. Although the topic of race is always a challenging one for students and teachers alike, there are three methods I focus on in this article, which many researchers have proven effective at producing productive conversations of race. Rather than explaining away the moments of racism within a text or the potentially racist perspective of its author, I argue teachers ought to use those moments as an opportunity to help students develop racial identities and the skills to navigate through a racially diverse world and one in which racism exists.

## Methods for Teaching: Literacy Theory

The first method, exploring texts through different lenses in literary theory, can be used to help students better understand the multiple perspectives that exist around and within a text, specifically texts that contain racism. Appleman (2009) proposes teachers should become familiar with different lenses used in literary theory, such as reader response, privilege and social class, gender, post-colonialism, and deconstruction, in order to utilize them when teaching a text. The job of teachers is not just to teach students how to read and write, but how to use reading and writing skills to make sense of the world around them. In order to do this, students must become familiar with ideologies, which Appleman (2009) defines as “the system of values and beliefs that help create expectations for individual behavior and for social norms” (p. 2). Although they can be harmless at times, some ideologies need to be questioned or resisted. A familiarity with ideologies helps students examine and potentially resist ideologies surrounding them, such as the racism present in *To Kill a Mockingbird*. What this means in regard to the racism present in the novels students read for school and in their lives is they may learn to identify racism and resist it.

Although examining texts through literary theory may seem like something useful only to literary scholars, taking on the perspectives of others, even people you may not agree with, is a skill students practice when using literary theory in the ELA classroom. This is also a skill they will use outside of school that will make them more empathetic to the lives and concerns of their fellow men who they may struggle to understand. Many of the activities Appleman (2009) suggests involve different groups of students taking on diverse lenses through which to view a piece of literature, reflecting through those lenses, and then sharing the differences between all the perspectives present in the work. One particular lens that Appleman (2009) describes that is specific to my purpose is the postcolonial lens, which she applies when teaching *Heart of Darkness*. She recommends asking students to rephrase the statement “Christopher Columbus discovered America” from a postcolonial perspective. Some examples she provides of actual student responses suggest the students were able to reevaluate the common phrase they had likely grown up hearing, such as one student who wrote, “Columbus took control of land inhabited for centuries by native people, and in the process stripped them of their independence and

unique culture” (Appleman, 2009, p. 91). Encouraging students to reconsider their preconceived notions as this student did, should be the goal when teaching texts that include racism. Appleman (2009) finds the postcolonial lens increasingly more important to utilize in classrooms due to the changing demographic of students:

As more immigrants and refugees enter our classrooms, we must consider a broader range of literary texts in order that our students may see themselves and their circumstances in the works they read. In addition, we need to consider the perspectives and identities of populations that historically have not seen themselves as part of the American mainstream. If we can successfully demonstrate for students from such groups that alternative ideologies belong within the American imagination, we will reveal the emancipating power of literary interpretation. (pp. 84-85)

Unrepresented groups are often presented in literature from an outside view, as we see in *Heart of Darkness*, which demands readers to question the accuracy of the view and the influences involved in the presentation of those people. Utilizing the postcolonial lens when approaching texts creates, therefore, a more inclusive classroom.

### **Methods for Teaching: Juxtaposition of Texts**

The second method, using the same thought process behind literary theory, is juxtaposition. Instead of looking for different voices or perspectives within the same text, juxtaposition is providing students with alternative texts written from a different perspective and comparing their views on the same topic. An example of juxtaposition is the use of slave narratives like *The Interesting Narrative of the Life of Olaudah Equiano*, or *Gustavas Vassa, The African* or *The Narrative of the Life of Frederick Douglass* to juxtapose with *Adventures of Huckleberry Finn*. As Chadwick-Joshua (1998) argues the influence of slave narratives on Twain’s character, Jim, it is important for students to have the ability to judge for themselves what influence Twain’s portrayal of a black man has on the statement he may be making in his novel. Similarly, texts written from an African’s perspective can juxtapose readings of *Heart of Darkness* in order to help students identify what aspects of Conrad’s novel can be viewed as instances of racism and help point out some of the inaccuracies inherent in the text. Writing on teaching *Heart of Darkness*, Blake (1982) describes her use of Ousmane Sembene’s *God’s Bits of Wood*, offering a colonialism-era African perspective to juxtapose with Conrad’s novel. Whole novels may not be necessary for juxtaposition, as Chinua Achebe’s renowned article, “Images in Africa,” written in response to Conrad’s novel, may also be valuable to compare with the text and offer students another voice from Africa. Echoing back to Appleman’s (2009) suggestion of teaching texts through multiple lenses, Blake (1982) notes:

Comparing novels written from different social assumptions shows students how the technical elements of fiction function to produce meaning, how the implications of point of view govern the entire work, as art as well as social construct, and how literary values are tied to social values. (p. 400)

*Heart of Darkness* can be taught without an emphasis on the racism inherent in it, instead with a focus on Marlow's psychological journey. However, ignoring the issues of race and racism present in these novels is only a means of inadvertently perpetuating racism. Calling students attention to racism and misconceptions of race in socially accepted texts enables them to identify racism and misconceptions of race within other aspects of society.

## Methods for Teaching: Open Discussion

The first two methods to approach teaching texts containing racism may be viewed as somewhat safer than the third: open discussion of historical and contemporary race relations. Researchers encourage teachers to utilize open discussion of race in their classrooms as a way to make the literature more relevant to their students' lives (Agbaw, 1998; Alberti, 1995; Borsheim-Black, 1998; Martin, 2014; Thomas, 2015). According to Thomas (2015), however, the common approaches to literary analysis used in classrooms today, such as reader response and new criticism, in which teachers focus on style, characterization, and personal reactions don't emphasize or encourage discussions of race. While teaching these texts through those limited lenses, teachers are "concomitantly developing social, cultural, and political attitudes in students alongside the teaching of reading and writing, and forming shared ethical positions around the most pressing contemporary issues" (Thomas, 2015, p. 155). Instead of perpetuating socialized racism or racial stereotypes by ignoring the racism present in texts and focusing on the purely literary value of a text, teachers ought to utilize those moments of racism to open a discussion with their students of what the author is saying about races or racism and analyze how or why this was a common conception then and if it still is today.

Although many research articles cite open discussion as necessary and effective for making texts that contain racism more relatable to students' lives, there are some problems teachers may encounter during such an open conversation on a frequently perceived controversial topic. Some of these problems are inherent in the text, such as the use of "nigger," while others are a result of social surroundings, such as "white talk" and "color blindness." Borsheim-Black (2015) states that this type of talk prevents white people from realizing their personal or collective role in the perpetuation of racism and a lack of acknowledgement of racial differences that only serves to perpetuate racism. Although these issues may be unresolvable for some students and in some scenarios, there are some methods that can be used to help reduce them.

## Discussion Problems and Solutions

Perhaps the largest problem teachers will encounter in any of the three texts mentioned in this article is the use of "nigger" in *Huckleberry Finn*, and for good reason. The word cannot simply be dismissed, Alberti (1995) argues, as a colloquialism of the time, nor can teachers *inform* their students that the word was used as part of Twain's satire to further effect the reader. Because teachers do not know what weight that word carries for each of their students, they must be careful not to dismiss it and to approach its use carefully. To make the discussion over the word more rel-

evant to students, rather than keeping it in the 1800's or 1930's, a discussion of the contemporary use of it seems necessary. Martin (2013) included the use of "nigger" in hip hop to analyze the evolution of the word and to help students reevaluate their own actions and views regarding race. Letting students into the controversy over the word in the novel is another method to approach it, especially allowing students to decide which version (original or censored) should be used in schools and defending their choice. Although discomfort will likely remain regarding use of the word, these practices may help alleviate some of it and allow for more genuine discussion.

Similar to the strategies above, there are also methods that can be used to help reduce white talk and color blindness. One strategy Thomas (2015) recommends for promoting genuine discussions of race is utilizing digital tools, such as online message boards, to help alleviate the discomfort students may feel when talking about race with their teachers and classmates. This is a tool that can easily be used in classrooms that may reduce the politically correct claims of color blindness or the socially accepted use of white talk, by allowing students to express their true opinions without fear of judgement. Another instance of color blindness was exhibited by Agbaw (1998) whose students did not want to focus their reading of *Heart of Darkness* on the presentation of the Africans and would rather have focused on other, less controversial themes of the novel. Claims of color blindness are also combatted by using close reading to demonstrate racist portrayals of Africans his students had initially missed and utilized those instances to generate discussion of the portrayal of race within the novel. Agbaw (1998) noted after those discussions, "[the students] came to realize how much their own reading of a text such as *Heart of Darkness* has been based on assumptions that have never been closely examined, and how much texts have helped to establish and to reinforce such assumptions" (p. 191). Open discussion holds the risk of running into the problem of white talk, color blindness, and discomfort with the use of "nigger," but these strategies can help alleviate the effects of these problems.

## Conclusion

While administrators, parents, and scholars across the nation ceaselessly debate the issue of whether or not racially challenging texts should be included in ELA curriculum, many English teachers are left with these contested and, thus, controversial texts in their classroom with often no guidance in how to present them to their students. Rather than avoiding a discussion of racism within texts, I argue teachers ought to use those instances of racism found in classic literature as an opportunity to help students develop racial identities and the skills to navigate through a racially diverse world and one in which racism exists. By utilizing the strategies described in this article, literary theory, juxtaposition, and open discussion, English teachers may use texts that contain racism more productively to open a genuine conversation of race and provide their students with the necessary skills to communicate with others.

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# Mathematics

# Changing the way that Math is Taught Conceptual Verse Procedural Knowledge

Jordan R. Joersz

**Abstract:** The purpose of this article is to present teachers with information and data regarding the relationship that exists between procedural and conceptual knowledge while attempting to validate the notion that the development of conceptual knowledge should be at the forefront of student learning in the mathematics classroom. The article first delves into the definitions and overall significance that each of these modalities have in the mathematics classroom and after doing so, the article examines the theoretical ideologies that encompass them. The article concludes with a look into how the two knowledge bases are related, as well as empirical evidence regarding which is better for effective classroom instruction.

## Introduction

Think of your earliest mathematics educational experience. For me, as well many others, it is probably completing routine, rote math problems to the point where you really do not know what you are doing, or how it is related to anything mathematical. You are simply following a predetermined set of rules that the teacher has given to you to solve each problem. There is no way of knowing if you are making mistakes, or if there is more to the problem than simply computing random digits using seemingly arbitrary information that may or may not apply to anything in the real-world.

For context purposes, think of how you were taught to divide fractions. Across the field, nearly all educators teach some variation of keeping the first fraction the same and multiplying by the inverse of the second term in order to get the solution. This is how it has always been done, and it certainly does its job in getting the students the correct answer, however, do students really understand what they are doing, or are they simply following a prescribed plan that the teacher taught them? Is it possible there is more to learning math than simply memorizing formulas, procedures, and applying random digits?

Now, picture a classroom where students are again working with division of fractions, but this time they are doing so with fraction strips and other manipulatives that allow the students to conceptualize this difficult topic in a meaningful manner. Instead of simply being told how to divide fractions, students are instead working together, discussing ideas, experimenting and exploring complex ideas to develop their own procedures for dividing fractions. There is far less explicit instruction by the teacher and the students are taking an active role in their own learning as well as engaging the materials in a meaningful manner.

The big questions educators have to ask concerning these two very distinct styles is: what is known about the effects of conceptual and procedural understanding in relation to the ability for students to retain mathematical ideas and concepts? Are the results for students different for type of instructional method, or is this simply a case of two ways to achieve the same result? How are the two modalities related? These are the pressing questions every new and long-standing mathemat-

ics instructor should be asking themselves. The answers to these questions directly impact how educators should deliver mathematics instruction to their students as well as how the students will engage in learning.

This article will focus on exploring the relationships that exist between conceptual and procedural knowledge, and attempt to establish the importance of a mathematics classroom that is based around the development of conceptual knowledge. There is no doubt that each type of knowledge is important and has its place in the mathematics classroom, however, it appears that conceptual knowledge should be at the forefront of all classroom learning.

The National Council of Teachers of Mathematics or NCTM (2014) has articulated this emphasis on conceptual knowledge by calling for decreased attention to learning procedures without any connection to meaning, understanding, or the applications that require these procedures. Are they correct in doing so, or is this an overly-complicated educational trend with no real basis?

## Definitions

According to Hiebert (1986), conceptual knowledge is characterized as “knowledge that is rich in relationships. It is a connected web of knowledge in which the linking relationships pervade the individual facts so that all pieces of information are linked. The development of this conceptual knowledge can only be done so by the construction of relationships between pieces of information” (p. 3). Hiebert (1986) defined procedural knowledge as two distinct parts. “The first part is the formal language of mathematics, or the symbol representation system. It includes a familiarity with the symbols used to represent mathematical ideas and an awareness of the syntactic rules for writing symbols in an acceptable form. The second portion of procedural knowledge consists of rules, algorithms, or procedures used to solve mathematical tasks. These are better described as step-by-step instructions for how to complete a task” (p. 6).

## Theoretical Constructs

If anyone looked into a math classroom across the United States right now they would see variations of the following three theoretical constructs regarding conceptual and procedural understanding in math. The first theory, which best characterizes a procedural-based classroom, is known as drill theory. The basic traditions of this theory state that children learn best when imitating the skills and knowledge of adults, understanding is not necessary for the formation of relationships amongst ideas, and the most efficient manner in which relationships form is through direct instruction and drill (Baroody & Dowker, 2003). This parallels the first classroom that was described at the outset of this paper and is the exact environment that the NCTM is trying to eliminate in the math classroom.

The opposing, reactionary theory to drill theory is the incidental-learning theory, which according to Baroody and Dowker (2003) states that “children should be free to explore the world around them, notice regularities, and actively construct their own understanding and procedures” (p. 7). This is the theory that children should be learning as a result of their natural curiosity in mathematics. Although

this may seem great in theory, it is impractical due to its time-consuming nature, its fragmented, unfocused nature, and most teachers and schools lack the ability to implement it effectively. This theory might work under the controlled circumstances with the right group of students, however, because of the deficiencies listed above, it is simply not practical.

The middle ground between these two theories is the meaning theory. This theory approaches learning from the perspective that students, at first, should engage in self-invented reasoning strategies prior to formal instruction as they provide the foundation for more developed knowledge and mastery. Instead of solely relying on drilling, the meaning theory instead uses it in a complementary role to increase permanence of recall. In further opposition to drill theory, the meaning theory allows time for students to construct an understanding of ideas and relationships that exist in math, instead of simply memorizing facts that mean nothing to them (Baroody & Dowker, 2003). This theory would match up nicely with the second classroom that was described at the outset of the paper and is quite similar to what the NCTM is promoting, which is a conceptually based classroom.

As a mathematics instructor, one of these theories should stick out as the best, or look familiar. Proponents of the drill theory believe that math instruction should focus on promoting mastery of basic skills, while putting little emphasis on understanding of concepts. Advocates of meaning theory, on the other hand, recommend the use of instruction and drill to promote skill mastery, but recognize the value of building students' experiences in discovery and conceptual understanding (Brownell, 1935). The incidental-learning theory is one that also focuses on the development of conceptual knowledge, but in a more informal setting where the students may or may not even know that they are learning.

## **Relationship between Conceptual and Procedural Knowledge**

There have been countless studies conducted in order to determine the best way in which students learn mathematics and these studies almost always boil down to one simple idea: the relationship between procedural and conceptual knowledge. Byrnes and Wasik (1991) describes one view which is known as simultaneous activation, or the idea that students' errors in math arise from the fact that mathematical symbols are meaningless to them. The argument for this stems from the idea that symbols are meaningless because computations are typically learned in a rote fashion or procedural knowledge. According to this view, errors are due to a low conceptual knowledge base.

The contrasting, dynamic interaction, view presented by Byrnes and Wasik (1991) states that procedures are developed due to a rich conceptual knowledge that allows the students to transfer procedures and ideas to new contexts. This view postulates that conceptual knowledge facilitates procedural knowledge and would effectively eliminate any reason for teachers to instruct their students in a rote, conceptually lacking manner. One study conducted independently by Byrnes (1992) directly supports this view and states that the students that had the "most conceptual understanding before treatment [instruction] came out of the study gaining the most procedural knowledge" (p. 237). This directly implies that it's in the stu-

dents' best interest to have a solid base of conceptual knowledge in order to also be procedurally-sound.

Rittle-Johnson and Alibali (1999) also investigated this relationship by looking at the impact that conceptual understanding had on procedural understanding and vice versa. The main point is that teachers should see where the most gains are being made by their students as this would allow teachers to streamline and improve their teaching practices. Rittle-Johnson and Alibali (1999) found that there are several ways in which the development of conceptual knowledge impacts procedural understanding, with the first being that the greater the conceptual knowledge, the greater the procedural skill, which directly supports the earlier statement by Byrnes (1992). The second idea is that conceptual knowledge naturally precedes procedural understanding in many cases. For example, some preschoolers already understand principles of counting when they first learn to count (Gelman & Meck, 1983). Third, the instruction about concepts, as well as procedures can lead to increased procedural skill, and lastly, increased conceptual knowledge can lead to increased procedure generation (Rittle-Johnson & Alibali, 1999).

This relationship does not seem to be unidirectional. In fact, they seem to influence one another. There is even a bidirectional relationship that exists (Rittle-Johnson & Alibali, 1999; Rittle-Johnson, Schneider & Star, 2015). Children that received conceptual instruction not only increased their conceptual understanding, but also generated several correct, flexible problem-solving procedures, whereas children that received procedural instruction adopted correct problem-solving procedures and increased their conceptual understanding. This might seem to suggest that conceptual knowledge is no more important than procedural knowledge, however, the gains made between these two modes were not symmetrical in nature and therefore do not suggest ambivalence. Children in the procedural-instruction group had significantly lower transfer performances, which limits the improvement that students can make conceptually. In contrast, gains in conceptual understanding led to fairly consistent improvements in procedural knowledge. Students that received conceptual instruction were just as likely to learn a correct procedure and were better able to transfer their knowledge (Rittle-Johnson & Alibali, 1999).

Rittle-Johnson, Siegler, and Alibali (2001) confirmed these ideas in their study that investigated 5th and 6th grade students and their development of conceptual understanding and procedural skill under the topic of decimal fractions. What they found was that the neither of these modalities develop in an all-or-none fashion, with acquisition of one type of knowledge always preceding the other. In fact, they found that "the two developed in an iterative, hand-over-hand process" (Rittle-Johnson, Siegler, & Alibali, 2001, p. 360). Similar to Rittle-Johnson and Alibali (1999), this study found that improvements in one often led to improvements in the other. These two studies seem to suggest that true proficiency in a mathematical domain, or topic, requires knowledge of both concepts and procedures.

## **Together, But Not Equal**

A fundamental focus of inquiry based mathematics, or conceptually based instruction, is the idea that students explain their thinking. This may not seem like something out of the ordinary, however, when talking about mathematical ideas,

teachers should be pressing students to justify their strategies and thoughts from a mathematical perspective instead of simply having the students describe the steps they took to solve a problem. Kazemi and Stipek (2001) showed this importance by investigating student learning in a high-press environment, or one that pushes for conceptual understanding, and in low-press environment, or one that pushed students to simply explain the steps they took to complete problems. According to the results, superficial, procedural understanding is not getting the job done in the classroom, and there seems to be a consensus that in order to promote the development of students' mathematical ideas, there needs to be a push for the following ideas: increased mathematical argumentation, mathematical thinking involving understanding relations among strategies, using errors provide opportunities to re-conceptualize a problem, and collaborative work involving reaching a consensus through mathematical argumentation (Kazemi & Stipek, 2001). In layman's terms, this means that there should be an increased push for conceptually based instruction. In support of this idea, Hallett, Nunes, and Bryant (2010) also found data that supports the notion that conceptual approaches will be more successful than procedural approaches in supporting mathematical learning, which they found by comparing a higher conceptual-lower procedural group with a higher procedural-lower conceptual group. Finally, Hiebert and Wearne (1996) also support this notion in their study, which found that students who demonstrated conceptual understanding are more likely than their peers to invent and modify procedures. The results of these studies, along with the findings of the Rittle-Johnson and Alibali (1999) study, suggest that conceptually centered learning leads to better results in the classroom and that developing understanding early in education leads to great results in the future.

## Conclusion

Overall, a clear link between conceptual and procedural knowledge exists in the mathematics classroom with both having their place in student mastery. There is an overall consensus that building relationships between conceptual knowledge and procedural knowledge leads to great improvements in procedural understanding, both from a symbolic and procedure-transferring standpoint, however, procedural understanding does contribute to conceptual knowledge, albeit in a lesser sense, by providing formal language and overall enhancement of the applicability of conceptual knowledge. Despite the fact that these two styles grow together and enhance one another, there is evidence that suggests that this is not an equal trade-off. Conceptual understanding improves procedural knowledge more than procedural understanding improves conceptual knowledge. With that in mind, it is clear that mathematics instructors should be pushing for more conceptually based classrooms and moving away from, but not eliminating, procedure-based learning environments.

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# “I’m Just Not Good at Math!” Rethinking What You Know About Mathematics

Katherine Ann Pohl

**Abstract:** There are many misconceptions regarding mathematics that produce negative student dispositions in a classroom. Such misconceptions are not fact based but are due to an ineffective, fixed mindset where a student limits their abilities based upon low self-efficacy and self-concept. Fixed mindsets fuel negative attitudes toward mathematics and can contribute to math anxiety. Studies have shown that the brain can grow and develop throughout a person’s life is partially dependent upon one’s mindset and experiences. Mathematics teachers can utilize a growth mindset where students have high self-efficacy and self-concept to promote positive dispositions toward mathematics. In doing this, teachers must model high teacher efficacy themselves and believe in student ability by disregarding false limitations set by prior experiences.

## Introduction

Close your eyes, take a deep breath, clear your mind, and think about your experiences with mathematics. Think about the mathematics teachers of your past and choose one teacher that has left their mark deep within your memory. Picture their classroom, the arrangement of the desks, your classmates seated around you, and your teacher diligently working through the lesson of the day. What is the mood and environment like in this classroom? Does your classroom consist of group work and mathematical chatter? Or is it quiet, orderly, and routine with students working independently on today’s lesson? Is your teacher motivating and passionate, moving through the room guiding and assisting students? Or apathetic and unstimulating? Reflect on the feelings that wash over you as you submerge yourself in this memory. Are you excited, content, bored, anxious, or nervous? Are you confident in your mathematical abilities? Would you say that all of your classmates are “good” at math? Based upon your experiences, how many students do you think have been positively affected by mathematics?

All elementary students have to take a math class, but it is the experiences that students have in that classroom that can shape their future in mathematics. Adverse student experiences in a classroom may cause negative attitudes and beliefs regarding mathematics. Such experiences can cause negative dispositions that directly affect instruction and learning mathematics in a classroom. These can be negative teacher dispositions through their conceptions or experiences on mathematics or they can be negative student dispositions that minimize motivation and participation. The teacher plays an important role in cultivating a positive learning environment that can improve student experience and mathematical achievement. Every student has the capability to conceptually engage in mathematics with the correct mindset and with knowledgeable teachers who model high teacher efficacy to counteract nega-



tive dispositions while increasing academic achievement. How can teachers prevent or rectify negative dispositions of mathematics in a classroom to improve student learning, experience, and perceptions of mathematics? To answer this question, student ability needs to be addressed.

## Ability and Misconceptions

Ability and limitations are a common topic of debate when discussing mathematics instruction and learning. There are many misconceptions regarding ability and learning thresholds in mathematics. Such misconceptions lead to negative dispositions and attitudes toward mathematics that directly affect how students view their limitations of mathematical achievement. According to Boaler and Dweck (2016), new studies have proven that the brain can grow and adapt throughout all stages of development in a human's life. They state that "the new evidence from brain research tells us that everyone, with the right teaching and messages, can be successful in math, and everyone can achieve at the highest level in school" (Boaler & Dweck, 2016, p. 4).

Another common misconception regarding mathematics is that some individuals are naturally "good" at math. Many students have uttered the phrase, "I'm just not good at math and do not have a math brain." Boaler and Dweck (2016) believe that "there is no such thing as a 'math brain' or a 'math gift.' No one is born knowing math, and no one is born lacking the ability to learn math" (p. 5). This is vital information for mathematics teachers to consider because it may change how teachers approach instruction regarding low-achievers. All students will not be mathematicians, statisticians, or actuaries, but Boaler and Dweck (2016) argue that all students have the ability to do well in mathematics with the correct mindset and support.

## Self-Efficacy and Self-Concept

Dweck (2006) has generated research that shows "the view you adopt for yourself profoundly affects the way you live your life" (p. 6). Here, student self-efficacy and self-concept fuse together predetermining how an individual limits their abilities. Self-efficacy has been defined as "people's judgments of their capabilities to organize and execute courses of action to attain designated types of performances... Self-efficacy contributes to motivation and determines the goals that individuals set for themselves" (Bandura, 1986, p. 516). Self-efficacy then can have positive or negative motivational influences that are correlated to achievement in a classroom. The way a student views their mathematical ability determines their individual goals for achievement. If a student views their ability as limited they will not strive to succeed and will settle for less than their innate ability.

Shavelson, Hubner, and Stanton (1976) describe how self-concept refers to an "individual's perceptions of the self that are formed through experiences and evaluative feedback received from significant others" (p. 336). According to Bong and Clark (1999), "Self-concept represents an individual's knowledge about him or herself along with emotional reactions toward the cognitively recognized competencies and attributes he or she possess" (p. 336). If a student perceives that they cannot achieve highly in math, they will develop a negative reaction to math which

lowers their self-concept. Bong, Cho, Ahn, and Kim (2012) describe how individuals emotionally react to self-evaluation and comparison to others heavily influences self-concept. They also discussed how self-concept differs from self-efficacy by describing self-efficacy as the students' confidence toward successfully performing a task, whereas self-concept describes their positive or negative views of themselves and their competencies. Self-efficacy and self-concept are generalized psychological constructs that mold student self-beliefs regarding their potential and ability.

### ***Mathematical Mindset***

Together, self-efficacy and self-concept lay the foundation for a student's idea of their abilities and limitations in any content, including mathematics. This idea of student limitations and attitude towards their perceived abilities forms their mathematical mindset. Dweck (2006) suggested that people have one of two different mindsets, a fixed mindset or a growth mindset. Boaler and Dweck (2016) describe a fixed mindset as "believing that intelligence is a gift that you either have or you don't have" (p. 5). A growth mindset is defined as "the belief that intelligence grows and the more you learn, the smarter you get" (Dweck, 2006, p. 34). Individuals set their own limitations in a fixed mindset where they tend to make excuses for their shortcomings, feel that they have to constantly prove themselves to others, and have a pessimistic perspective of themselves. Individuals with a growth mindset persevere through tough situations and look at every hurdle as an opportunity to learn which, "allows people to thrive during some of the most challenging times in their lives" (Dweck, 2006, p. 7). If a person has a fixed mindset, this does not mean they are forever cemented within this limited state of mind. The mindset of a person can change back and forth between a fixed and growth mindset depending upon their life experiences and surroundings (Blackwell, Trzeniewski, & Dweck, 2007).

To put this into perspective, Boaler and Dweck (2016) discuss differences in brain ability. Everyone is not born with the same brain but the brain can change and grow throughout life based upon an individual's experiences. They looked specifically into a well-known genius and theoretical physicist, Albert Einstein.

Einstein, probably the most well-known of those thought to be a genius, did not learn to read until he was nine and spoke often about his achievements coming from the number of mistakes he had made and the persistence he had shown. He tried hard, and when he made mistakes he tried harder. He approached work and life with the attitude of someone with a growth mindset. A lot of scientific evidence suggests that the difference between those who succeed and those who don't isn't in the brain they were born with, but their approach to life, the messages they receive about their potential, and the opportunities they have to learn. The very best opportunities come when students believe in themselves. (Boaler & Dweck, 2016, p. 5)

Boaler and Dweck (2016) linked this data to the importance of high student self-efficacy and self-concept in a mathematics classroom. Self-belief is the key to cultivating a growth mindset where students will embrace mathematical challenges through problem solving, reasoning, and critical thinking. Students need to believe in their own abilities and potential regardless of past experiences to achieve success

in a mathematics classroom. When students do not have self-belief, they develop a fixed mindset and often math anxiety.

## Math Anxiety

Another important issue that teachers need to be aware of is math anxiety which Blazer (2011) defines as “negative emotions that interfere with the solving of math problems” (p. 1). Blazer (2011) revealed, “approximately 93 percent of Americans indicate that they experience some level of math anxiety” (p. 1). Math anxiety can develop at any age and physical symptoms include increased heart rate, clammy hands, upset stomach, and light-headedness. Further, Blazer (2011) research has shown that math anxiety disrupts student performance in a classroom because it reduces the working memory of students and prevents their ability to block out distractions and retain important information. Math anxiety poses is an additional obstacle between the student and their mathematical success. This anxiety also disrupts the accuracy of mathematical assessments because assessments are not able to precisely measure student ability due to their anxiety (Blazer, 2011).

Math anxiety impedes student success because it supports and enables a fixed mindset. Students become so focused on achieving the correct answer that they develop a fear of making mistakes. Boaler and Dweck (2016) reported on studies that found the brains of individuals with a growth mindset reacted differently to mistakes than the brains of individuals with a fixed mindset. The studies found that “the brain activity was greater following mistakes for individuals with a growth mindset than for individuals with a fixed mindset” and “a growth mindset has a greater awareness of errors than individuals with a fixed mindset, so they were more likely to go back and correct errors” (Boaler & Dweck, 2016, p. 12). This means that mistakes provide opportunities for the brain to grow and develop. However, today, our society views mistakes as something negative or even as failure, when really mistakes are essential to achieving success in learning. This data shows how important self-efficacy is for mathematics students when they confront a mistake or error in their work. Students need to have a growth mindset where they face mistakes as an opportunity and a challenge instead of failure.

In some mathematics classrooms, correct answers are celebrated and mistakes are associated with failure. To alleviate math anxiety, Boaler and Dweck (2016) advise teachers to change the message of mistakes and incorrect answers in mathematics. They recommend educating students on the importance of making mistakes because it is an opportunity for the brain to develop and grow. One of their strategies is outlined below:

Teachers should share with students that they are looking for their favorite mistakes, which should be conceptual mistakes, not numerical errors. Teachers can then share the mistakes with the class and launch a class discussion about where the mistake comes from and why it is a mistake. This is also a good time to reinforce important messages—that when the student made this mistake, it was good, because they were in a stage of cognitive struggle and their brain was sparking and growing. (Boaler & Dweck, 2016, p. 17)

When teachers celebrate student mistakes it removes the negative stigma that is associated with making errors, alleviating math anxiety. This promotes the development of a growth mindset and positive dispositions regarding mathematics. Other strategies of celebrating mistakes involve minimizing testing and grading in a classroom where mistakes are associated with punishment. Boaler and Dweck (2016) also recommends one-on-one interaction between teachers and students where teachers can explain incorrect answers. This technique fosters brain development allowing the brain to grow and learn. By doing so, students will interpret mistakes as opportunities to become more knowledgeable instead of discouragement and failure.

### ***Teacher Efficacy***

What do self-efficacy, self-concept, mathematical mindsets, and math anxiety have to do with a mathematics teacher? Mathematics teachers have a responsibility to their students to be aware of the emotional state of their students and differentiate their instruction between those with a fixed mindset and a growth mindset. Mathematics teachers need to be aware that the brain can grow and change based upon the self-concept, self-efficacy, and experiences of each individual student. Teachers need to acknowledge that unless there is an intellectual disability, all students have the capability of obtaining mathematical success in the right classroom environment when they receive the proper support. It is the responsibility of the teacher to provide that support.

Further, mathematics teachers need to believe in their own abilities to instruct, engage, and lead their students. They need to embody teacher efficacy which is defined as “a judgment about capabilities to influence student engagement and learning” (Woolfolk Hoy & Davis, 2006, p. 117). According to Cantrell, Young, and Moore (2003), student learning and mathematical achievement are largely effected by the instructional performance and teaching efficacy of the math instructors. Teachers have the power to influence students to overcome anxiety in math by engaging and encouraging their students in learning. Chang (2015) investigated this idea by examining the effects of teachers’ efficacy on student mathematical self-efficacy. The study found that there are significant effects of mathematical teachers’ efficacy on student mathematical achievement. Chang (2015) findings “indicate that the more efficacious a mathematics teacher the better her/his students’ mathematics self-efficacy, and that, in turn, promotes their mathematical achievement” (p. 1317). Teacher efficacy is important for the development of student self-efficacy and for promoting students’ learning achievement. Mastery experiences, verbal persuasion, vicarious experiences, and physiological arousal have an effect on teacher efficacy. Additionally, student self-efficacy was positively affected by teacher’s effective teaching performance which was reinforced by teacher efficacy. By improving student self-efficacy and academic achievement, negative mathematical dispositions will improve due to positive teacher efficacy (Chang, 2015).

### **Conclusion**

A teacher’s mindset on their approach and attitude toward teaching can make or break a student’s experience in a classroom. Teachers are the most influential and

useful tool in a classroom that can cultivate positive self-efficacy and self-concept within their students. Observant and attentive teachers can identify students with negative dispositions and fixed mindsets toward mathematics to broaden the individual limitations for success preconceived by each student.

Teachers need to take a pledge that no matter how low a student's self-concept in math is, to never let them say that they "cannot do math." Research has shown that it is a myth that individuals are innately good or bad at mathematics. Teachers need to acknowledge that all students have the ability to conceptually engage in mathematics with a growth mindset where the brain grows and develops over time. They need to pledge to model high teacher efficacy and enthusiasm to improve student self-efficacy and academic achievement. Students should be able to grow confidence in math without anxiety, uncertainty, or negativity. It should become the mission of math teachers to ensure that their students leave the classroom with a new appreciation for mathematics. All students should have the opportunity to develop a growth mindset where they have cultivated a positive disposition of student self-efficacy, self-concept, and an appreciation for the prodigious world of mathematics.

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# Science

# Differentiation in the Science Classroom An Overview of Strategies to Aid in General Science Instruction

Jennifer Anne Croft

**Abstract:** One could argue that the hardest part about science is reading the material. The vocabulary within the text is difficult, there are many graphs, pictures, equations, diagrams, and tables of information all added to enhance the text, but can be overwhelming (Mason & Hedin, 2011). With all of these various factors contributing to the complexity of science texts, how can students ever read a science text successfully? Through the utilization of literacy accommodations provided by the teacher, students in the regular education science classroom are capable of improving their academic achievement, especially in reading science texts. In this article, accommodations for science texts will be examined, and how these accommodations can fit into various types of instruction within a classroom.

## Introduction

When considering how to help students read science literature to a regular education science classroom, there are many ways to dissect the problem to find a solution. The best way to go about this task is to take into consideration the audience of the literature, which would be the students and their grade level. In guiding students as they read through various passages, teachers will need to employ various reading strategies to complete this task. This can be completed in a multitude of different ways depending upon the needs of the students individually and the needs of the class as a whole. In any science classroom, students represent a variety of academic abilities and background knowledge. Some students may arrive in the classroom with a firm foundation of previous knowledge and superior reading skills while others may arrive with little to no previous knowledge and poor reading skills that are grade levels behind their peers. Still even other students may be a composite of the two students previously described or have a list of accommodations and services that need to be fulfilled, making the task of assisting students with reading science literature difficult to even the veteran teacher.

In a conversation with a veteran intervention specialist, Kathy Herman, she explained that if there was a technique that helped a student to be more successful in the classroom, try it. If it works, share the technique and the student success with the intervention specialist so they can amplify that success and incorporate the technique into the student's IEP or 504 Plan (personal communication, September 14, 2015). After having this conversation with her, I decided to try new accommodations with my students who have identified needs. After trying various instructional methods throughout the school year, I began to see an increase in both student success and student motivation in all of students. I found that my students put forth more effort into their science studies because I developed rapport with them and recognized their potential to do well in school.



For students that enter a classroom with a disdain for science altogether, whether or not they have a special learning disability, the challenge of helping them learn provides a more complex task for the general education teacher. Not only does the teacher need to figure out how each student learns best, but he/she also needs to implement various practices into his/her lessons. This could be done by having “blanket” accommodations for the entire class, such as reading each question on a test or quiz aloud, or scaffolding a lab activity prior to the students beginning the lab. In this example, the needs of multiple students are met at the same time, it provides support to students who would normally struggle otherwise on various activities, and it does not single any student out.

There is a negative aspect to using “blanket” accommodations in this manner. There is no single, cure-all teaching method or strategy that will lead to success for every student; the learning needs in any classroom are much too diverse. Identifying a specific strategy that works for students could take weeks, months, or sometimes even years in order to see measurable success, and for the students to actively participate and assist with using that strategy. All students in a general education science classroom are capable of improving their academic achievement, especially in reading science texts. Their success depends upon which accommodation can be utilized to take them to the next level in their reading performance.

## The Complexity of Science

Ability and limitations are a common topic of debate when discussing mathematics instruction and learning. There are many misconceptions regarding ability and learning thresholds in mathematics. Such misconceptions lead to negative dispositions and attitudes toward mathematics that directly affect how students view their limitations of mathematical achievement. According to Boaler and Dweck (2016), new studies have proven that the brain can grow and adapt throughout all stages of development in a human’s life. They state that “the new evidence from brain research tells us that everyone, with the right teaching and messages, can be successful in math, and everyone can achieve at the highest level in school” (Boaler & Dweck, 2016, p. 4).

Another common misconception regarding mathematics is that some individuals are naturally “good” at math. Many students have uttered the phrase, “I’m just not good at math and do not have a math brain.” Boaler and Dweck (2016) believe that “there is no such thing as a ‘math brain’ or a ‘math gift.’ No one is born knowing math, and no one is born lacking the ability to learn math” (p. 5). This is vital information for mathematics teachers to consider because it may change how teachers approach instruction regarding low-achievers. All students will not be mathematicians, statisticians, or actuaries, but Boaler and Dweck (2016) argue that all students have the ability to do well in mathematics with the correct mindset and support.

## Varying Levels of Vocabulary

To add to the complexity of the nature of science vocabulary there are three levels of how vocabulary can be classified as Beck, McKeown, and Kucan (2002) explained. The difficult nature of the vocabulary along with the complexity of reading

science texts and applying that knowledge in a laboratory setting, can prove difficult for students at all levels. In any classroom, students may be affected by the difficult nature of science content, as well as the integration of other subjects, such as mathematics, that are a major part of science curriculum.

There is a large need to stress the understanding of science vocabulary due to the complexity of the field of science. Science content has three levels of vocabulary which are words that have common everyday meanings, words that have common meanings and scientific meanings, and words with only scientific meanings (Beck et al., 2002). To help students understand the meaning of words in science texts, teachers need to utilize various strategies to help students understand the vocabulary in the context of the passage and in science.

Vocabulary instruction is not limited to the classroom and its beginning should be initiated at home when students are young.

Children learn their first words through oral language in the home. Students start school already knowing thousands of words, learned at home through verbal interactions. Children who are provided with the most verbally supportive atmosphere at home (e.g., word explanations, discussions, storybook reading, etc.) learn far more words than those whose families engage in fewer of these verbal behaviors. (Ebbers & Denton, 2008, p. 91)

Without the foundation of common reading skills students are quite unprepared or “under” prepared or both, by the time they reach the secondary science classroom. Combine the lack of basic vocabulary and reading knowledge with the complexity of a science text, and there may be little chance for the student to ever understand the material in a passage. However, there are ways to assist students with reading science texts and to keep them on pace with their peers and increase understanding.

## **Bridging the Reading Gap**

Together, It seems as if teaching science literature is an impossible task in which no student will ever succeed, no matter how hard or diligent a teacher applies his/her knowledge and skills. This feat of teaching students to read and understand science literature is not as difficult as could be perceived. However, it may require accommodations in order to bring students with lower reading skills to the same level as their peers. Before examining the various intervention methods used to accommodate the needs of students, it would be beneficial to review the differences between accommodation and modification. Scanlon and Baker (2012) described an accommodation as a change in the way a lesson is instructed to all individuals in a classroom, and does not require an IEP or a 504 plan in order to do so. Accommodations allow students an opportunity to learn on the same level as their higher achieving peers. When utilizing an accommodation, the curriculum does not change, and all students are being held to the same educational standards. A modification is quite the opposite and requires the alteration of the curriculum and not all students are held to the same educational standard. Modifications “require specific definitions within an IEP or 504 plans for a specific individual student, not an entire class” (Gennerman, 2015, p. 6).

Some interventions that can help in developing various accommodations that any teacher can use in his/her classroom will be discussed. Mason and Hedin (2011) stated that “in science classes, teachers must consider the need for explicit, systematic reading instruction for students with learning disabilities (LD)” (p. 214). Further, they suggest that “The complexity of the information conveyed through print may make science texts the greatest reading challenge that students with LD encounter in school” (p. 215). Due to the complexity of science literature, students require a proper foundation in order to comprehend the material. This foundation as rich background knowledge of science concepts and the ability to make a variety of type of inferences. Problems could arise from this if students are lacking that foundation, making teaching an impossible task in the secondary science classroom (Mason & Hedin, 2011).

To be able to use certain strategies to promote student learning of science concepts from the text, Mason and Hedin (2011) recommend the use of text enhancements. “Text enhancements specific to science text validated in research include: instruction in the use of text illustrations, creation of representational illustrations, imagery (i.e., visualization), and adjunct aids” (p. 217). Along with text enhancements, the following practices are suggested for effective instruction:

- (1) scaffolded and segmented lessons, moving students from simple, concrete text to complex, abstract text;
- (2) organized, focused, and appropriately paced lessons that contain only well-organized and critical strategies and concepts;
- (3) review of prior skills and knowledge;
- (4) goal setting, both the teacher and students should establish goals for what is to be learned;
- (5) teacher-led modeling by thinking out loud the complete process for applying the strategy to reading science text;
- (6) use of example and nonexamples of strategy application to text;
- (7) multiple opportunities for students to respond to what is learned in text;
- (8) monitoring – teacher monitoring with corrective feedback and student self-monitoring text comprehension;
- (9) ample guided practice, distributed over time, that ensures students’ mastery and maintenance of strategy application; and
- (10) opportunities for teacher and student reinforcement for meeting goals. (Mason & Hedin, 2011, p. 220)

These practices offer many ways to modify secondary science curriculum to increase the success of students. Applying these skills in a science classroom will help increase the reading ability and comprehension of science literature.

## Implications

In research studies, there is a focus on accommodating science literacy for students with learning disabilities, but there is little research on accommodations for students who struggle with science as a whole. I believe that all students are in need of some accommodations to succeed in science. This could include the use of a graphic organizer to help students diagram a lesson topic, or something as simple as reading test questions or lab procedures aloud. There needs to be a change within the science teaching community on how our students are being taught to read science literature.

There are multiple ways that science text can be transformed from an intimidating reading passage into a practical piece of literature. Through scaffolding, graphic organizers, and instructing students on the vocabulary within the passage, students should be able to understand the content knowledge that is being presented in the passage. Another key piece is to allow time for students to process the knowledge. Without adequate time for students to learn the vocabulary and to analyze the text, the content knowledge is lost. There is a learning gap amongst educators between science and special education and this needs to change. Additional research is required for advancement in ways to bridge the gap between science and special education teachers, but improvements are slowly being implemented. Making accommodations is a beneficial practice for all students. Once the right accommodations are implemented, the learning possibilities are endless. The accommodations will take time to develop and try, but the success of students being able to read and comprehend science literature will make this time well spent.

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# Socializing Science Education Empowering Students Through the Use of Discourse and Argumentation of Socioscientific Issues

Christin Wilkens

**Abstract:** Science teaching must begin to accommodate the changing role that science and technology has in the modern world. Citizens have increased avenues in which science can be used in decision-making in their lives and teaching students only content knowledge is not enough to equip them with the critical skills they need. Science education must promote social justice by giving all students opportunities to learn the nature of science as it relates to socio-scientific issues and explore the different values that are embedded in scientific decision-making. Science education should not only address content, it should encourage discourse and practice of science in order to empower students with skills to become responsible participants in their personal, professional and civic lives.

## Introduction

Take out a pencil and paper. Draw a scientist. What is in your picture? What is your scientist doing? If you drew a white guy with crazy hair working alone in a laboratory creating various concoctions or something dangerous, you have drawn the same image as the majority of students who have participated in this activity since 1957. The Draw-a-Scientist Test (DAST) activity has been researched with school aged children to get a sense of their perceptions of science and these results have guided reform of science education (Farland-Smith, 2012). In one study of the DAST in a 4th grade class half of the students drew something dangerous, such as bombs and poisons. One student drew their scientist holding a test tube with a caption stating that he will destroy the world (Brooks, 2012). According to Farland-Smith (2012), students' perceptions about scientists affect their attitudes about science in the classroom. Further, if students cannot relate to those who use science, they often become disengaged from science. The language and practices used in science classrooms can also be alienating. Students struggle to make connections with science content and how an ordinary person can use science. Additionally, students commonly see science as dangerous and capable of posing threats in society (Brooks, 2012). Based upon the above research from Farland-Smith (2012) and Brooks (2012) it can be surmised that students are confused about science, and this confusion is creating critical problems in society.

As science knowledge has evolved and the use of science and technology has increased exponentially, citizens are faced with numerous science-based decisions as consumers, voters, professionals, and participants in society. In order for students to make informed decisions on issues such as climate change, water and air quality, agriculture, public health and medicine, and energy use, adequate understanding is key. Students today will be affected most by the predictions made by scientists for the future. Science is not just for future scientists. Science affects us all, and science

education must address that. Science is more than just content. It is a tool that can be used to explain that natural world, make predictions and create solutions. Students who do not connect with science content are likely unable to make informed decisions about science in their lives. Hence, science instruction must begin to accommodate the changes from the use of science and technology. Education should not only address content, but allow for discourse and practice of science in order to empower students with skills to become responsible participants in their personal, professional and civic lives.

## Social Process of Science

The creation and use of scientific knowledge is a social process. How we view and conduct science has changed drastically over time. According to Morris (2013), the use of science and technology for mass purposes increased greatly during the “industrial revolution or industrial society” (p. 1144). However, we have now evolved into a post-industrial society, one dominated by science and technology. The conduct of science currently affects our environment and populations at much greater rates than the pre-industrial and industrial societies, and citizens have more avenues in which they can share a voice in the conduct of science. As voters, consumers, professionals, and participants in society we have a much greater control of the decisions we make that affect the well-being of all components of society. As we have entered an information age, students and citizens have access to scientific knowledge, both accurate and inaccurate, at exponentially greater rates than past eras. Due to the changing nature of the world, and the different contexts in which science is used and learned, students must be equipped with the skills in order to understand their place in society as it relates to science.

In the creation of scientific knowledge, scientists have different experiences, abilities and purposes that help mold conclusions drawn by scientists. Although many scientists have the ultimate goal of being as neutral as possible, sometimes it is not achievable. This socially constructed scientific knowledge, either as theory or as empirical evidence, is used for a social purpose. This scientific knowledge may be used by other scientists, policy makers, engineers, citizens, or consumers to form biased conclusions or to be used to support the use of a new technology (Kolsto, 2001). Unfortunately, bias can lead to misuse of scientific knowledge, which can translate into the development of misconceptions. All of these elements, which include the subjective, tentative, and social aspects of science constitute the Nature of Science (NOS).

Common misconceptions of the NOS offer learners and science educators an opportunity to interact with science in an authentic way. Events from the scientific community impact what occurs in the science classroom and to address the impact of socially constructed science, teachers can use the concept of socio-scientific issues (SSIs). SSIs are “science-related, social, open-ended dilemmas” (Khishfe, 2014, p. 976) that often pose problems in society and spur controversy in search for solutions. Current SSIs involve, but are not limited to, climate change, food and agricultural concerns, public health, and resource use. Through the study of SSIs, students can accept and understand the NOS.

## Science for Social Justice

In coming to an understanding of the social process of science and SSIs, students have a right to be equipped with skills to transform these problems. A current trend in science education is promotion of scientific literacy, which involves equipping students with science knowledge to be able to be productive members in society as adults. However, the ability to use scientific literacy in adulthood varies when students have limited access to opportunities in which to utilize science or have little knowledge of the various contexts in which science is used. Therefore, science teaching should aim to create social justice by promoting equal access to science not only through scientific literacy but also critical literacy. Students should be empowered with the skills of science including content knowledge, discourse, and practice in order to be able to transform their own lives. With current SSIs that marginalize specific groups, and with others who hold more power in decision-making, it is essential that students be equipped with the skills to understand and act upon that. Barton and Upadhyay (2010) give three assumptions that need to be accepted in science education for social justice: "...having the opportunity to learn science as content knowledge, discourse, and practice is a civil right; teaching and learning science involves critical activism and citizenship; and the goals of science literacy involve personal, social and economic empowerment" (p. 5). Science teaching, therefore, is not only the mastery of content knowledge. The NOS and current SSIs make it imperative that science should evolve to include discourse and practice.

Science teaching for social justice should aim to develop students with critical science agency. This is an element created in a model for Democratic Science Pedagogy by Basu and Barton (2010). Critical science agency is the ability of students to be central in knowing and doing science. Many students already have a strong science knowledge base. This knowledge should be used as a stepping stone to develop their own learning and projects with guidance, not direct instruction, from the teacher (Basu & Barton, 2010). A key element for empowering students with critical science agency is through allowing discourse and argumentation in the classroom. This ensures that students' voices, experiences, and ideas are valued in relation to science content and a dialogue is formed to develop solutions to SSIs.

## Discourse and Argumentation

Effective science teaching is known for engaging students in hands-on labs, simulations, experiments, and investigations which are all methods of inquiry. These methods are crucial for helping students to construct their own understandings of science content. There is also a push for engaging students in argumentation. An exact definition of argumentation is lacking in science literature, however "...it is commonly defined as an assertion or a claim and its accompanying justification" (Khishfe, 2014, p. 976). Argumentation also often involves constructing counter-arguments. Therefore, when students engage in scientific argumentation, they are taking observations from the process of inquiry and using them to explain a science concept. However, given the NOS and a goal of science teaching for social justice, these claims should be made about SSIs in order to give students the ability to form their own opinions. During this process, the many contexts-including social,



political, and ethical-embedded in science will be attached in students' arguments. However, students should not first be presented with these contexts in the argumentation stage of teaching. Student discourse should be embedded within all stages of science teaching in order for students to be familiarized with all contexts of science.

Discourses can be defined by "Gee (1996) as ways of knowing, doing, talking, interacting, valuing, reading, writing, and representing oneself that are 'always and everywhere social,' produced and reproduced in social and cultural practices" (Barton & Tan, 2009, p. 51). Academic discourses vary across contents and it is commonly accepted that it is important to make explicit each discourse in order to become proficient in that content. However, academic discourses vary greatly from the cultural and social discourses from students' personal lives. This can make academics difficult and alienating for many students. However, Barton and Tan (2009) argue that students' discourses should be incorporated along with academic discourses to create 'hybrid spaces' and should be used when studying critical problems in students' lives.

Barton and Tan (2009) conducted a study in an urban 6th grade classroom. A six-week unit about food and nutrition was taught in which students were given opportunities to incorporate their cultural discourses in order to better understand the science content connected to food and nutrition and the issues faced in being able to use this content knowledge when making decisions about food. Examples of discourses included family discourses when students were asked to interview family members about a favorite recipe and share it with the class. Students not only shared the recipe, but also analyzed how funds of knowledge about food come from mothers; how there is shared responsibility in decision making surrounding food; and how there are challenges to obtaining access to nutritious or adequate supplies of food. Students also shared community, peer, and popular culture discourses in similar ways to analyze how science content could be used in the students' lives and to solve problems. Students were able to realize that students already had a wealth of knowledge about food and nutrition and were able to connect that with the shared wealth of academic knowledge from the teacher. Science was seen as a tool to understand the students' lives and not a directive from the teacher to understand expert authority. Not only were democratic principles met in the classroom, but every student in each of the five participating classes completed the final service project with a passing grade. This is in stark contrast to the norm, where many students do not complete projects and receive failing grades (Barton & Tan, 2009). Creating hybrid spaces is also essential for developing students with critical science agency, helping students to understand social contexts embedded in science, and scaffolding content so that students are prepared to participate in effective and meaningful argumentation.

One part of science discourse that teachers can share with students is argumentation. This skill is essential for students to develop their stances on SSIs that will transfer to social, professional and political discourses outside of school. In argumentation, students have the opportunity to use empirical evidence constructed from inquiry and apply it to the social contexts of science. Students can share their experiences and opinions, however also acknowledge the differences between scientific empirical evidence and epistemic justifications. Khishfe (2014) researched how argumentation instruction affects students' abilities to reason about SSIs. In



this study, students participated in an eight-week water safety unit. All participating students were given explicit argumentation instruction, but some treatment classes were also given explicit NOS instruction. NOS instruction involved exploring that science is tentative, empirical and subjective and argumentation instruction allowed students to discern between empirical science evidence and epistemic justification. For example, students made claims about the fluoridation of water. A student opposed the fluoridation of water because scientific evidence shows that it can cause cancer, it violated people's rights to safe water, and fluoride does not have approval from the FDA. Another student supported fluoridation because scientific evidence supported that fluoride can prevent dental disease and also is an inexpensive way to promote public dental health. Each argument was justified with scientific and epistemic reasons, students were able to discern between each, and students could engage in rebuttals and reconstruct their stances. Results showed that all students' understandings of the NOS improved at the end of the unit and classes that received explicit NOS instruction had significantly greater levels of both NOS and argumentation skills. Allowing students to explore the NOS in context of SSIs and receiving explicit argumentation instruction can be effective at developing students with abilities to engage in scientific discourse.

## Criticism of SSI

Critics of teaching SSIs argue that controversy should be omitted from the classroom (Hodson, 2003). Teachers should remain as neutral as possible to avoid indoctrination because a mastery of content will automatically allow students to apply content to decisions in students' personal lives. However, Hodson (2003) points out that omitting the political and social values embedded in science is influencing students in a particular direction in itself. Leaving out these contexts is also contradictory to the NOS. Students have a right to explore science in the ways that it is, and will be, presented to them in their lives. This stance does impose values upon students, however these values are formed with the best interest of the students by equipping them with knowledge of how to be responsible and empowered democratic citizens (Hodson, 2003). Not only that, but an increase in content knowledge has not been proven to increase the ability to use science in its contexts.

Previous studies mentioned (Barton & Tan, 2009; Khishfe, 2014) in this article have supported how teaching SSIs can improve student content outcomes. In addition, Sadler and Donnelly (2006) specifically conducted a study to explore if there is a correlation between content knowledge and the ability to effectively argue about SSIs. Students were surveyed and interviewed about genetic engineering. The majority of students rarely used genetics content knowledge in reasoning. Less than 10% of students referred to genetics content in their responses and those responses gave very general references to genetics content. Interviews also showed students referring to science fiction and the media to explain their stances. These results prove concerns about application of content knowledge. Science must be taught in current social contexts so students can develop the critical skills they need.

## Conclusion

Students have a right to understand and act upon issues that affect them today and to be equipped with skills in order to understand issues they have yet to face. Science teaching must incorporate the changing NOS in the modern world. Science content knowledge is not enough for the students of today. They must have opportunities to engage in discourse and exploration of SSIs. Students can become engaged and familiarized with science by incorporating non-academic discourses from students' lives, which can be used to enhance the teaching of scientific discourse and argumentation. These discourses can guide students to understand multiple viewpoints and contexts of critical SSIs in order to be empowered to transform science problems in their lives. Through these practices, content expectations can be met and students can develop as informed and empowered citizens.

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# **Social Studies**

# Developing Democratic Participation Through Civil Liberties Education in Social Studies Classrooms

Geoffrey L. Earnhart

**Abstract:** Social studies educators must prepare students for the challenges of a changing world by providing them content knowledge and developing attitudes conducive to participatory citizenship. Most future government policies will have civil liberties implications, thus studying these issues provides a firm foundation for future decision making. Teachers should approach this content using student-centered methods in an open classroom climate in order to build students' political efficacy that they will need for the future. These techniques equip students to be informed decision makers and encourages them to participatory citizens in later life.

## Introduction

James Cason, the mayor of Coral Gables in Florida, is attempting to determine whether future owners must pay property taxes if sea levels rise and permanently flood their oceanfront homes (Joyce, 2016). Elon Musk and Bill Gates, founders of PayPal and Microsoft, respectively, recently joined physicist Stephen Hawking and hundreds of others to caution governments and technology companies about the dangers of developing artificial intelligence (Sainato, 2015). Today, futurists and technologists worry that exponential growth in automation, made possible by advances in artificial intelligence, may eliminate most low-skill jobs, leaving millions without livelihoods (Thompson, 2015). The MIT Technology Review (2015) argues that self-driving cars must be programmed to weigh the life of the vehicle's occupants against those of pedestrians and decide in emergencies which to endanger.

Technological, economic, and environmental change is occurring at an accelerating rate and in unpredictable ways that will profoundly affect the current generation of students. These changes will require governments to adopt policies that will profoundly affect American society. To effectively influence how future policies will shape communities and society, students must understand and be prepared to act as participatory citizens in the democratic governing process. Willingness to participate in the governing process is largely determined by a person's "political efficacy, [or] the belief that individuals' actions can influence governmental processes" (Levy, 2011, p. 238). History teachers have a responsibility to prepare students to act as participatory citizens by furnishing their minds with civic knowledge and building their political efficacy.

Levy (2011) argues that political efficacy is best developed through the application of student-centered, inquiry-based teaching practices, and that the topic of civil liberties affords teachers a particularly good area of content for building political efficacy. Many current and future social issues have civil liberties implications, providing a common basis for examining these topics. Teachers should conduct these examinations using student-centered teaching practices in classroom climates that

incorporate discussion, debate and discourse to foster political efficacy in students, thereby increasing the likelihood that students will participate in democratic society as adults.

## Challenges

Social studies educators face a number of challenges when preparing their students to act as participatory, democratic citizens. Foremost among those challenges is overcoming the sense among young people that they are unable to affect the course of the political process. Indeed, when looking at the size and scope of government institutions at all levels in the United States, and the complex, and often hidden, processes of governing, attempting to influence that machine can seem a daunting prospect (Bennet, 2008). By building the political efficacy of students as they mature through their adolescence, social studies educators can help overcome the seemingly insurmountable prospect of participating in the democratic process.

Education reform efforts further complicate the task of preparing students to participate as good citizens in democratic society. The decade following the passage of the No Child Left Behind Act or NCLB, saw many school districts reduce instructional time in social studies, adding time for instruction in the math and English language arts (ELA) concepts assessed by standardized tests. A study by McMurrer (2007) for the Center of Education Policy concluded that “over one third of school districts reduced social studies instruction time by an average of 76 minutes per week in order to add time for math and ELA” (p. 7). While the study did not address whether students experienced a diminution in the quality of teaching, even high quality education cannot make up for vast reductions in instructional time.

Reductions in educational time and the introduction of greater standardized testing does not eliminate the responsibility of social studies teachers to prepare future generations of citizens. Ohio’s social studies learning standards (2010) require teachers to use social studies instruction to prepare “students for their role as citizens and decision makers in a diverse, democratic society” (p. 4). However, preparation is more than accumulating knowledge. A fully prepared citizen also possesses the skills and motivation to actively participate in the processes of governance. Future citizens must be able to acquire the knowledge necessary to develop informed opinions on local and national issues as well as the dispositions towards participatory citizenship. It is necessary for students to participate in democratic processes such as voting, advocating, and organizing. As adults, the students of today may also choose to participate in democratic society through active membership in civic groups, volunteer organizations, or by working to advance policy initiatives. Teachers should define participatory citizenship broadly, so students can develop their own intrinsic concepts of citizenship and participate in society accordingly (Youniss, Bales, Christmas-Best, Diversi, & Silbersen, 2002).

Helping students develop a concept of citizenship, or prerequisite to participation extending beyond their local communities, presents a further challenge. Students should understand how policies that are made at all levels of government affects their lives. Even after years of social studies instruction, adolescents tend to define their concepts of citizenship based on experiences within their local communities (Chiodo & Martin, 2005; Hickey, 2002). High school students tend to see

being a good citizen as obeying the law and helping their neighbors. Such a narrow concept of citizenship is insufficient if the goal is to provide students the skills and knowledge to fully participate in democratic society. However, social studies educators can use content and pedagogical techniques to help students develop more robust understandings of democratic citizenship.

## Civil Liberties Education

*Ms. Franklin's high school government class is learning about the Bill of Rights. Using traditional teaching methods that include the textbook and lecture, Ms. Franklin explains the individual liberties protected by each amendment, while the students take notes and fill in a graphic organizer. Many students struggle to stay engaged; some ask how any of the material applies to them. Ms. Franklin's students, who come from various socioeconomic backgrounds, are skeptical that anything they do will change how "the government" acts, concerns she struggles to address while ensuring that the class covers all the information required by the state's social studies standards.*

Our fictional social studies teacher, Ms. Franklin, faces several challenges in preparing her students to act as participatory citizens. The students struggle to connect the concepts of individual liberty, the text of the Bill of Rights, and their personal experiences. Being able to connect theoretical concepts with real-life situations is critical to the students' ability to make informed decisions about social issues and government policy. Furthermore, Ms. Franklin's students lack political efficacy, a problem exacerbated by the diversity in her classroom. The more students are removed from the centers of socioeconomic power, the less political efficacy they are likely to possess (Campbell, 2008). However, Ms. Franklin can use the content and concepts of the Bill of Rights to prepare students civic knowledge and improve their political efficacy.

By explicitly teaching her students about the Bill of Rights and the civil liberties it protects, Ms. Franklin greatly improves the chances that her students will develop favorable opinions for protecting civil liberties (Goldenson, 1978; Green et al., 2011; Lopez, Levine, Dautrich, & Yalof, 2009). In particular, she can use the Bill of Rights to help differentiate between civil liberties and civil rights, providing appropriate frameworks for assess government policies and actions. Although opinions vary, the concept of civil rights centers on the idea that individuals deserve freedom from discriminatory treatment, usually on the basis of belonging to a protected group, and that governments should provide that protection. Civil liberties, however, centers on the idea that individuals ought to be free from unnecessarily oppressive government authority, and that civil institutions should limit government action in certain areas of society (Schmidt, 2014).

Civil liberties content offers an engaging and robust vehicle for developing political efficacy and civic knowledge in social studies students. Almost every contemporary and future issue facing American society has civil liberties implications, allowing teachers to relate the content to the lives of students. Issues related to the freedom of speech, religion, assembly, protest, due process, search and seizure, gun ownership, and government surveillance saturate the news. Some students may have personal experience with some of these issues and have an opinion on these topics.



Although she was writing about history, Yogeve (2013) ideas about strengthening political thinking by employing “teaching practices that take into account youthful rebellion and a typical juvenile desire to fix the world” (p. 267) apply just as well to the civil liberties. Issues of autonomy and freedom are fundamental to individual and civic identity, and are likely to engage a wide range of learners in the content. Furthermore, high school is the last formal educational environment for many adolescents to learn about the role civil liberties play in democratic society. Confronting issues related to civil liberties in a structured, well-planned instructional unit offers opportunities to develop the political efficacy necessary to become participatory citizens.

## Building Political Efficacy

*Across the hall from Ms. Franklin’s class, Ms. Park’s class also studies the Bill of Rights. After a day covering the content of the Bill of Rights, Ms. Park has tasked each group to create solutions to address the issue of online bullying, taking into account the civil liberties protected by the Bill of Rights. She moves from group to group assessing their progress, asking leading questions, and directing students to the classroom’s computers to conduct further research. During the discussion phase, one group proposes a government ban on making disparaging comments online. Another wants the government to monitor the internet for bullying and punish the offenders. Some students object to these proposals on First and Fourth Amendment grounds. Ms. Park moderates the discussion, ensuring students are respectful of their peers’ opinions, even when they disagree.*

Ms. Park’s instructional approach to the Bill of Rights is more conducive to building political efficacy than Ms. Franklin’s traditional teaching method. The students in Ms. Park’s class apply the concept of civil liberties to a relatable problem that has gained national attention in recent years. Through conducting research and class discussions into such problems, students begin to understand how government policies can affect their lives. That being said, Levy (2011) explains that learning about social issues is not enough to build political efficacy. Rather, developing political efficacy is linked to creative cognitive processes. Addressing social issues is more effective at building political efficacy if students study and develop solutions to problems they can relate to and that they encounter in their communities (Youniss et al., 2002). By requiring her students to develop solutions to community problems, while considering the civil liberties implications, Ms. Park facilitates the development of their political efficacy.

Allowing debate and discussion also improves the development of students’ political efficacy and the likelihood that they will become participatory citizens. Morrell (2005) indicates that experiencing a deliberative policy making process can enhance the political efficacy of students with respect to the issues under consideration. This growth in situation specific efficacy is likely to increase student’s overall political efficacy. Discussion and debate also instills the respect for a variety of opinions necessary for democratic governance (Campbell, 2008). Ms. Park employs these techniques when she allows her students to discuss and respectfully disagree with the opinions of others on the issue of online bullying.

Ms. Park further enhanced the development of political efficacy in her students with her student-centered teaching approach and open classroom climate. Campbell (2008) defines an open classroom climate as one where students engage in debate, discussion, research, and problem-solving. Campbell indicates that students in such classrooms tend to retain more content knowledge and demonstrate stronger, positive feelings towards civic participation. Furthermore, students gain greater appreciation for conflict and respectful disagreement in democratic processes. It was also evident that students from lower socioeconomic backgrounds, who are the least likely see civic participation positively, demonstrate greater willingness to participate in political society when they learn social studies in an open classroom environment (Campbell, 2008). Ms. Park's open classroom climate contributes to the development of political efficacy in her students.

## Conclusion

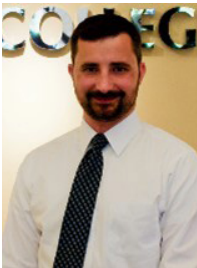
Employing the approaches advocated in this article entails some risk-taking on the part of the teacher. When examining issues related to civil liberties, teachers should remain cognizant of several issues. First, social studies educators must avoid introducing their political beliefs into the classroom. Explicit or implicit communication of teacher bias will taint discussions and alienate students possessing different opinions. Second, students are likely to align with other students sharing similar opinions on certain issues, but teachers must be sure that all students feel free to express their opinions. Civil discourse is the goal, which a loud and unified group might undermine if left unchecked. Finally, teachers must understand that certain topics are more politically charged or personally sensitive than others. Students may disagree on the best approach to stopping online bullying, but are unlikely to agree that such behavior is unacceptable. More politically contentious issues such as gun ownership or abortion generate no such consensus and should be approached with careful consideration.

Despite the potential controversy of addressing civil liberties content, social studies teachers must prepare students for the unpredictable and accelerating changes of the future. These changes will require government policies that impact future citizen's civil liberties. To develop participatory citizens capable of meeting these challenges, teachers must provide necessary content knowledge and facilitate the development of political efficacy in students. Civil liberties instruction provides a robust and engaging field of content that teachers can use in conjunction with student-centered teaching approaches in open and respectful classroom environments to prepare their students for the challenges of participatory citizenship in the future.

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# Technological Resources in the History Classroom

Rebecca Fork

**Abstract:** As a history teacher, it is not uncommon to hear students explain that they “hate” history class. Today, students are oftentimes turned off and uninterested when they are required to merely memorize dates, names, and events through traditional means like lectures. With the advances in technology and increasing presence of technological resources in school, teachers must seriously consider including technology resources in their toolbox of teacher methods. There are various types of technological resources available to the history teacher such as digital storytelling, online simulations, and virtual history museums. With these techniques incorporated into the classroom, teachers will grasp the interest of the students. The students intern will be able to increase their understanding and apply the lessons learned to become effective members of society.

## Introduction

Have you ever heard someone claim that they just hated history class? This sentiment is spoken frequently to history teachers from students as well as adults. Oftentimes, with traditional teaching methods in history class where students are required to memorize names, dates, and events, students become turned off and uninterested in the subject matter. Traditional instruction methods such as lecture and teaching from the textbook are shown to be less effective, for the students of this generation. The students of today are very connected to their technology. Teachers need to investigate other instructional techniques in the classroom to engage their students. One suggestion is to utilize technological resources in the classroom. With the integration of technological resources such as digital storytelling, online simulations, and virtual history museums in the history classroom, student engagement in the subject of history as well as their retention of information will increase.

It is important for students to learn history because the teachings that they learn will help shape them as citizens and influence their role in society. Social studies as a subject in school promotes social understanding and civic efficacy in fostering students in their citizenship development. The teaching of social studies helps students learn to become responsible, critical, reflective, and active citizens who can make informed and reasoned decisions about the issues in society (National Council for the Social Studies, 2013). Furthermore, the study of history should be modeled to develop the critical thinking and reasoning skills of students by providing them with historical knowledge, procedures, and skills. With these skills, young citizens can distinguish facts from opinions, detect biases, and recognize the core of one’s argument and its logic and strength of evidences to critically evaluate the positions of others (Yilmaz, 2008). Social studies, including the study of history, is meant to promote these competencies providing students with the resources to become effective citizens and to have a positive impact within society. To enact this vision, it

is imperative that teachers employ the best methods available in order to ensure that students are receiving the civic lessons learned through the study of history.

## Technology in the Classroom

The current generation of students must be taught history in a manner different than the traditional classroom. In the past, the main methods of instruction utilized straight lecture and reading from the textbook with an emphasis on memorizing names, dates, and events. Sheldrake and Watkin (2013) describe the current situation in this way, “So, what’s the problem? They hate school. Why? Education has not caught up with this new generation of tech-savvy children and teens. It is not that they don’t want to learn. They just learn differently” (p. 30). Schools are now equipped with computers that connect to the Internet as well as other digital resources. With the increased presence of technology in schools as well as in students’ everyday life, teachers must create and utilize new methods of teaching that incorporates technology. There is a desire from the students to integrate technology into the classroom rather than past instructional methods.

History teachers need to harness whatever effective pedagogical methods are available in order to spark interest in learning. Technology integration is the new method that teachers can use. Through technology, teachers can grasp and keep the interest of students so they will more fully comprehend and retain the valuable lessons being taught. With the increased presence of technology available in schools, it is important for history teachers to maximize these technological resources as they design their lesson plans. According to Buzzard, Crittenden, Crittenden, & McCarty (2011) “Technology may actually be a positive influence in creating a new knowledge revolution. Instead of using technology for only its social and entertainment value, students can learn to use instructional technologies as a skillset for the future and, in doing so, learn more efficiently” (p. 131). Students of today are surrounded by the ever-growing developments and innovations in technology. They have cell phones, laptops, tablets, iPods, and other technology that is truly at their fingertips everywhere they go. With these devices being so readily available they want to use it, even in the classroom.

Implementing methods such as storytelling and simulations with technology in the history classroom can aid teachers in encouraging and nurturing an interest in history. This article is going to break down some ways in which history teachers can bring technology into their classroom. By altering instructional methods history becomes more appealing to students, and optimizes the learning experience. Students are able now able to bridge the gap between understanding the information of the past in order to be able to apply the lessons learned to the present and to the future as well.

## Digital Storytelling

Traditionally, storytelling has been one of the more effective methods of teaching history in the classroom as it “provides opportunities to create relevance and meaning for students” (Stewart, 2016, p. 29). With the advent of technology, it can become exponentially more effective when incorporated into lessons. Van Gils

(2005) promotes the technique of digital storytelling explaining that it is telling a story by incorporating digital media such as pictures, video, and audio clips into a presentation. This is a beneficial tool to use in education because the stories can be personalized not only to the person creating it, but also to the people who will be learning from it. Digital storytelling can be compelling by bringing information from the past to life, thus engaging students in the lesson. Some students absorb more information if they hear it and see it simultaneously, rather than just hearing or just seeing. By incorporating graphics, pictures, videos, audio clips, and music digital storytelling enhances basic storytelling by making it more relatable to students. As a result of this integration, Van Gils (2005) found that students feel an emotional attachment to the topic when digital storytelling connects factual history to the theories being taught. This technology tool encourages a deeper level of reflection and learning on the part of the student.

In addition to utilizing digital storytelling as an instructional approach, there are also benefits to having the student develop the digital story as an assessment technique. Robin (2008) reports that digital storytelling in the classroom promotes students' ability to conduct research, organize their findings, and present what they have learned in a more creative way than writing a research paper. More importantly, there is a higher level of critical thinking along with effective problem solving skills for students who learn through digital storytelling. Students learn to think critically, analyze, evaluate, and ultimately present the information effectively utilizing the new technology.

The utilization of these new resources, such as digital storytelling, help students grow in their understanding of history. Robin (2008) states, "...but today's students are using them [resources] at an ever-increasing pace and in ways that are helping to define a new generation of not just information-gathering, but information-creating as well" (p. 221). By giving students the opportunity to create their own digital story, it is helping them define who they are as a person and citizen through creative expression. Cole, Street, and Felt (2012) argues that digital literacy increases, "access to tools and opportunities for interactivity and co-construction [which] also means increased generativity, i.e., more capturing, crafting, telling, retelling, editing, publishing, processing, and meaning-making. These are the activities upon which literacy in general, and digital literacy in particular, depends" (p. 114). Digital storytelling serves as a tool that not only aids in giving students a more thorough understanding of historical events, but is a tool and resource that students can utilize in order to build their critical thinking and technological skills.

## Online Simulations

Through online simulations, teachers are able to disguise a learning experience as a fun source of entertainment. Devlin-Scherer and Sardone (2010) suggest the use of digital simulations because they "can often capture the attention of less eager or uninvolved students" (p. 138). Because history has been described by many as boring and irrelevant, online simulations serve as a potential motivation for those students who are less involved in learning through traditional methods (Chiodo & Byford, 2004). For example, these simulations afford students the opportunity to experience certain roles in history. They can examine various historical situations

“first-hand” and through problem-solving and critical thinking skills develop solutions. With the experience of these more authentic situations, students develop a more comprehensive grasp of the content. This facilitation of learning allows student to connect general events into the historic themes in a more holistic way than traditional teaching methods.

Online simulations serve as a type of “game”, but have an educational aspect to it. For instance, through online simulation, a student can visit the city of Rome at the height of the Roman Empire. They can virtually walk the streets as a tour guide expounds on the history of Rome, which provides the student the opportunity to feel what life was like there (Van Gils, 2005). McCall (2012) concludes that the, “capacity for simulation games to provide navigable historical problem spaces is [the] greatest contribution to a 21st-century history education at any level of instruction” (p. 12).

Here, the line blurs between simulations and educational video games. Many try to avoid using the term games for fear that it illegitimizes the learning experience. However, the reality is that students of today have the desire and will embrace these teaching techniques. McCall (2012) states that parents and teachers should not discount simulations as a strategy because of the use of the term game. Instead, they should embrace it as a tool in which students will eagerly engage. Gradwell and DiCamillo (2013) defend this thought further stating that, “these pedagogical tools [are] simply that – tools of the craft: the more deft the craftsman, the more masterful the outcome. Thus, with a talented teacher, the use of simulations can foster students’ historical thinking and appreciation of the past” (p. 40). These digital simulations are technology resources that hook students into enthusiastically engaging in the history classroom.

## Virtual History Museums

Virtual history museums are a blend between digital storytelling and online simulation. They are online resources, which effectively harnesses the new digital technology as a means of teaching analysis and interpretation of historical events and artifacts. Rostamian and Barkeshli (2015) report that leading IT company, Google, has collaborated with 151 museums, many of them international, in an effort to provide a virtual gallery tour for any student, no matter their geographical location. For example, students can virtually visit the Louvre or the East Indies Museum, which exhibits art from Southeast Asia. Google also has received many positive comments from historians and scholars regarding these virtual galleries. Rostamian and Barkeshli (2015) conclude that as a result of the virtual experience, students are able to inspect maps and artifacts, trace heritages, and access more information than if they were to actually visit the museum. Unfortunately, for many students, time at a museum is limited due to geographical location, but within the virtual history museum, students can spend endless amounts of time combing through the boundless contents of the ever-expanding virtual history museums from the comfort of their own school or home. With this resource, they are not missing out on the valuable information that the museums are offering. Twining (2009), states, that there are literal and pragmatic benefits that are possible to present in a virtual museum that cannot be done in the real world. He argues that in a virtual world, you can do things



that are impossible in the real world. For example, in the virtual world you can “fly like a bird (without even having to flap your arms)” (Twining, 2009, p. 498). Virtual history museums open up possibilities like these for students to experience history beyond the boundaries of a physical museum and their classroom.

Within virtual history museums, there is the opportunity for either the teacher or the student to become a museum curator. When acting as museum curator, students, “examine, interpret, and understand some aspect of social studies, such as a person, a place, event, or issue” (Bouck, Courtad, Heutsche, Okolo, & Englert, 2009, pp. 15-16). As curators, teachers can use this technique to modify the museum so that it customizes the experience according to the learning objectives for their particular lesson. Teachers have flexibility with this resource and can adjust the vocabulary and the language in order to meet the level of student comprehension for their students. Further, the virtual history museums, such as the one found at the Smithsonian, offer different classroom activities, lesson plans, writing assignments, as well as chart and map activities. All of these lessons requires students to assimilate information from different sources and draw their own conclusions. With history being a general education class, teachers will have students who are on various reading and comprehension levels. The virtual history museums are flexible to accommodate these differences so that all students can have the opportunity to enjoy the learning experience through this type of online simulation. This method also touches all students who thrive under the different learning modalities, such as visual, auditory, or tactile.

Some may argue that the use of these technology resources may cause the teacher to substitute their actual teaching with online simulation games and take the easy way out. Instead, teachers can utilize simulations as a supplement to their lesson, incorporating it in with discussions, research, and debates to help students absorb and retain historical lessons far better than merely following the lessons prescribed by textbooks. In essence, these technologies are not meant to take the place of traditional lessons, but to supplement the lessons being learned by combining the strengths of simulation games with the teacher’s own pedagogical tools, further appealing to students.

## Conclusion

The fact that the current generation of students does not remember a time when they were not surrounded by technology, today’s history teachers must incorporate technology and its resources into their classroom. As digital enhancements continue to increase in our everyday lives, teachers need to embrace these methodologies of digital storytelling, online simulations, and virtual history museums in order to relate to the students and effectively teach history. Certainly, with the inclusion of these technological resources students may start to like or at least appreciate history. They may remember the lessons learned from the past and feel motivated to be a part of their history class. Ultimately, this will contribute to these students becoming effective citizens who positively impact society.



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# How to Start a Rebellion Using Film to Engage Social Studies Students

Ariel Jones

**Abstract:** History teachers face the obstacle of connecting content about the past to their students living in the present. Research in the fields of film, psychology, and education suggest that the use of narrative film in the social studies classroom actually more effectively engages students in the class itself, as well as the historical material. When they are more engaged, they grow cognitively, as well as in terms of their meaningful learning and preparation to become citizens of our society. This article explores the views of experts in these fields, as well as the implementation of film as a teaching tool in an urban high school history class.

## Introduction

*A solemn gathering in a town square. Teenagers stand dressed in their best clothes, stone-faced and on edge as they face the stage. They view the government's film through glazed eyes looking at the giant screen up front, but not really watching. A vibrantly dressed, earnest woman steps to the microphone; far too happy for such a grim occasion. She wishes the crowd a "Happy Hunger Games!", before choosing the two tributes, children really, who will represent District 12 in this year's games. Tributes to fight to the death on national television; a mandatory viewing. Tributes who are up for slaughter at the hands of their own government.*

That scene that I described above is bleak, dark, and probably thought provoking. It makes the reader, at the very least, sympathetic to the plight of the tributes. Readers of the novel *The Hunger Games* by Collins (2008) and viewer of the movie version by Brissell and Ross (2012) likely know this scene well, and yet it is unlikely that one might experience it without any kind of emotional reaction regardless of how many times they have experienced it. Perhaps a viewer of the film would feel for Primrose, the Everdeen sister whose name is chosen at this Reaping Ceremony. Perhaps they begin to wonder what the nation of Panem's citizens generally think of their government's enforcement of yearly Hunger Games. Viewers might have a different emotional reaction entirely, but ultimately they are engaged in what they are watching. They consider the world of the film to be true in this moment and authentic as involuntary reactions to the events unfolding in front of their eyes.

What if a history teacher showed this scene in class? What if viewing similar scenes helped a history teacher to better fulfill the goals of a lesson? What if it engaged the students more fully in the content? As history teachers, it should be our goal to meaningfully teach the events that shaped our world and our society. It is through the incorporation of film as a supplemental teaching tool that we are better able to achieve student engagement and ultimately contribute to our students' growth as future citizens. The use of film in the classroom is often viewed as a crutch: something that replaces "having to actually teach." However, the research and discourse in the fields of psychology, film, and education suggest that the use

of narrative film in a social studies classroom can contribute to the cognitive development of students, refine their critical thinking skills, and engage them in the content material on a deeper, more meaningful level. Engaging students in historical empathy removes them from their own world and places them in closer relation to the time and place which they are learning. This article will operate using Endacott and Brooks (2013) definition of historical empathy:

Historical empathy is the process of students' cognitive and affective engagement with historical figures to better understand and contextualize their lived experiences, decisions, or actions. Historical empathy involves understanding how people from the past thought, felt, made decisions, acted, and faced consequences within a specific historical and social context. (p. 41)

The matter of narrative film in the classroom is relevant to members of the educational community in that a priority of education is the achievement of meaningful long-term learning and connection to the real world.

## Psychological and Film Theory Factors

Psychological research and the study of empathy lay the foundation for the overall justification of using narrative film in a social studies classroom. Elements of psychology are also evident in the study of film theory, as well as the application of narrative film in the classroom. Empathy itself is “the feeling that you understand and share another person’s experiences and emotions; the ability to share someone else’s feelings” (Merriam-Webster, n.d.). Psychologists Eisenberg and Fabes (1990) state that “Empathy, sympathy, and related vicarious emotional responses are important concepts in developmental, social, and clinical psychology” (p. 131). This demonstrates the benefit to the growth of each individual when they display and practice an emotional response. Furthermore, empathy is not the same as sympathy, although the two terms are often misused interchangeably. Empathy requires one to take on the emotions of the person or people they are watching, while sympathy only requires pity for them. The spectator therefore never has to actually feel the way the subject feels, but rather they only need to acknowledge it.

Film theory often explores the connection between narrative film and emotion while incorporating the elements of film production techniques. Coplan (2006) of Emory University agrees with others in the field that film evokes an “automatic, involuntary [reaction] because of the viewer witnessing the characters’ emotions coming to fruition, and refers to this process as emotional contagion” (p. 26). Emotional contagion “requires direct sensory engagement and...is unique to our experience of audiovisual narratives” (Coplan, 2006, p. 26). This would mean that a student will have a unique reaction to a film as opposed to reading the order of historical events out of their textbooks. The reaction comes to them more naturally. Furthermore, in film theory there is the foundational understanding that viewers suspend what they know of reality and accept the truth being shown to them on screen. Coplan (2006) adds

...because emotional contagion responses do not involve beliefs or the imagination but are based on automatic and involuntary processes, spectators’ experi-

ences of emotional contagion will be virtually identical to real world experiences of emotional contagion. (p. 26)

Coplan (2006) would advocate for film in the classroom as a means to a meaningful activity; practicing caring about the plights and successes of other people. Film theorists would also argue that techniques such as extreme close-ups, shallow focus, and point-of-view are the director's way of manipulating and dictating viewers' emotional response, regardless of if the viewer personally enjoys that director's style or not.

## Classroom Application

In Dr. Stuart Foster, lecturer of social studies education at the Institute of Education at University College London, notes in a piece by Bryant and Clark (2006) that students should be transparently primed on the content of both the historical material and the film. He notes that teachers need to, throughout this process, also “address the inaccuracies transparently with students and use those inaccuracies as learning opportunities about bias, production time/place, and so on” (p. 1058). Foster also advises that “students form research teams to investigate relevant contextual information [and] encouraged to ask critical questions of their sources” (quoted in Bryant & Clark, 2006, p. 1058).

One teacher in an urban high school used the book *The Hunger Games* while teaching a unit on the Civil Rights Movement to her 10th grade honors American History students. First, she taught the content itself, particularly focusing upon the early days of the movement. Then, in preparation for the film, she distributed the writing assignment rubric with these instructions:

After watching *The Hunger Games*, break down the beginning of the movement in the story according to the aspects of a social movement that we discussed in class (leader, methods, message, etc.). Then choose one civil rights group from your text and compare/contrast it with the movement in the film. The focus of your work should be on how movements begin and develop, so any focus on the end results of a movement should be minimal but is certainly useful. (Jones, 2016)

Students then participated in a discussion about what elements of a social movement would likely be present or necessary regardless of mission and social issue. Students made suggestions such as purpose, symbol, leader, and action. While the educator facilitated the instruction in that she provided areas of discussion such as those just listed, there was otherwise minimal prompting from her for the students. This conversation laid out the context for watching *The Hunger Games* by giving students elements to watch for while also checking for understanding of the state-mandated material.

Transparent discussion also took place in which students noted the people who write their textbooks and those who make curriculum policy, as well as when *The Hunger Games* was made and released and by whom. They understood that ultimately, no matter how important a film's story might be, studios ultimately want a financial return on their investment. Questions were posed asking students to

identify the goal of the film and allowed students to come to their own conclusion about financial success. These are all steps of engaging in historical empathy that are essential to its function. It was with these elements in mind that students viewed the film over the next three days.

During the viewing, the teacher did not interrupt the film so as not to interrupt the emotional momentum for the students. At the conclusion of the film, most of class time was spent outlining the facets of social movements as displayed in *The Hunger Games* and the Civil Rights Movement. In this discussion, which followed the same model as the pre-viewing discussion, students demonstrated deeper understanding for the events of the South in the 1940s and 1950s than they had prior to viewing the film. For instance, they picked up on the negative relationship between government and the masses and were even visibly upset by it. They also noted who controlled the media in both circumstances: white men in the South and the Capitol in Panem. Students further demonstrated enhanced knowledge and engagement through their writing assignments that were due the following week.

Final writing products varied in a couple of different ways. First, students who were more familiar with *The Hunger Games* series were permitted to include information from beyond the first film, and as a result they were able to build even stronger cases for their observations. Second, students were able to draw similarities and differences between the film and any Civil Rights organization they wanted such as Student Nonviolence Coordinating Committee or Congress of Racial Equality. Struggling writers were also given graphic organizers to help prepare for the final assignment. These accommodations also follow best practice as shown through the National Center on Universal Design for Learning (2016) because they “help students to organizer their thoughts and establish relationships between ideas” (“Why UDL?,” para. 2).

Written products also displayed varying levels of achieved historical empathy. While there was deeper understanding of the Civil Rights Movement across the board, most students demonstrated more advanced understanding of the connections between the Civil Rights Movement and *The Hunger Games*. Many were able to step beyond the content at face value and make personal assertions and observations. Students who wrote at this caliber often included their own emotional reactions to portions of the film and how the individuals in the southern United States must have felt given their own experiences. Students who went through the motions of the assignment, made little to no assertions beyond regurgitating facts and making basic connections, and rarely writing with much emotion. It soon appeared that while both the class discussions and written assignment during this lesson were successful, the discussions demonstrated more emotional engagement and historical empathy in this circumstance than the writing assignments. This, however, is likely a result of the many student complaints that they “do not like writing” and not against the purpose behind the assignment. This is the limit of every teacher’s abilities; ultimately, the students need to want to do the work and stretch themselves emotionally. Be that as it may, each student at different junctures of this process clearly engaged in and demonstrated historical empathy and emotional engagement with the Civil Rights Movement through the lens of *The Hunger Games*.

So, what could be improved? What worked well with the best practices of education? In what Colby (2008) calls the “historical narrative inquiry model”, the primary goals for student achievement include advances in

...a renewed interest in and attention to the past...the development of procedural knowledge...the development of the ability to analyze and critique authentic historical documents...the acquisition of interpretive skills for historical narratives...formation of historical perspectives based upon evidentiary history... [and] the articulation of those perspectives through student-authored historical narratives and argumentative essays. (p. 2)

These goals highlight the fact that assessment for historical empathy and emotional engagement are somewhat subjective, but can still be demonstrated in ways that are individualized while being supported by the content. This can be done through assessment tools such as rubrics, which dictate what is to be demonstrated, but not necessarily how.

Colby (2008) like others in her field, also emphasizes the importance of in-depth questioning upon using less traditional historical texts. The teacher in this 10th grade social studies room did that both before and after viewing, although the writing prompt itself could have urged beyond content information. It could have gone beyond third-person and endeavored into first in order to practice what Endacott and Brooks (2013) call perspective taking which focuses on understanding “another’s prior lived experiences, principles, positions, attitudes, and beliefs in order to understand how that person might have thought about the situation in question” (p. 43). Students are not always told in a traditional school setting to let their emotions come into play, and to expect them to do so without explicit help from the teacher may have been why there were students who held back emotionally. Endacott and Brooks (2013) also suggest the use of role-playing debates and reflection activities in order to achieve this. Additionally, Brooks (2008) notes in her own work the importance of transparency with students, stating that the ultimate goal of this teaching practice is “a balance between careful analysis of historical evidence with creative, inferential thinking, both of which are necessary to understand and explain the past on its own terms” (p. 145).

## **Conclusion**

Film, when used appropriately, can be incredibly beneficial to teaching the social studies curriculum. The psychological and developmental research indicates that growth in these areas of the human experience are necessary to becoming a well-rounded, well-developed individual. As teachers, using the psychological, film theory, and classroom application evidence should be encouragement to venture outside of our possibly traditional methods of teaching. There is a stigma attached to using a film in class; that it essentially is not teaching and is not a productive use of time. However, I argue that teachers are charged with not only teaching our pupils the subject matter, but also preparing students for the world outside the classroom. Film allows history teachers to do both.

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# Learning to Teach

## Language Arts, Mathematics, Science, and Social Studies *Through Research and Practice*

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