

Learning from each other: What social studies can learn from the controversy surrounding the teaching of evolution in science

By: [Wayne Journell](#)

This is an Author's Accepted Manuscript of an article published in

Journell, W. (2013). Learning from each other: What social studies can learn from the controversy surrounding the teaching of evolution in science. *Curriculum Journal*, 24(4), 494-510. doi:10.1080/09585176.2013.801780

as published in the *Curriculum Journal* 2013 [copyright Taylor & Francis], available online at: <http://www.tandfonline.com/10.1080/09585176.2013.801780>.

Abstract:

This article addresses the need for researchers to move beyond discipline-specific approaches to research and practice and offers an example of how interdisciplinary understandings can increase knowledge in respective disciplines. The specific focus of the article is the shared challenges of broaching controversy in science and social studies classrooms. Although there is much that social studies teachers can learn about the teaching of controversial public issues from the challenges science educators face in teaching evolutionary theory, and vice versa, the two literature bases have little overlap. Through this example of broaching curricular controversy in the classroom, the author argues that content instruction can be improved by increasing awareness of research and practice in other disciplines

Keywords: controversial public issues | evolution | science curriculum | social studies curriculum

Article:

The closing session at a recent meeting of the College and University Faculty Assembly, the research association of the National Council for the Social Studies, was a panel discussion that addressed the question of whether social studies scholarship was ‘weak, isolated, and incestuous’. This claim had been made to one of the panelists by a colleague from another discipline, and the apparent basis for the claim was this individual's perception that social studies research tends to ignore broader educational research and is typically published in disciplinary-specific journals only read by those within the field (Tyson et al., 2011). The scholars on the panel largely refuted the claim for a variety of reasons, but the underlying premise that social studies education, like most content areas, is often isolated from other disciplines has merit.

The truth is that scholars are often pigeonholed into specific disciplines or content areas. This voluntary segregation seems to be especially true for those who define themselves in terms of content-specific disciplinary knowledge – they attend content-specific conferences, read and publish within content-specific journals, and congregate with disciplinary colleagues in their own

departments and schools of education. Dedication to one's content area, however, is not always problematic. Scholars are driven by that which they are passionate about, and certainly, there is considerable value in being able to discuss research and practice with those who 'speak the same language'. A problem exists, however, when disciplinary segregation keeps scholars from better understanding the complex nature of issues within their respective fields.

In this article, I argue that scholars and practitioners can better identify possible implications related to issues affecting their respective content areas by becoming more aware of how those in other disciplines address similar pedagogical issues. Specifically, I focus on one of my primary research interests, the teaching of controversial public issues within the social studies curriculum, and attempt to bridge the gap between teachers' experiences dealing with public controversy in social studies classrooms and the longstanding challenges science teachers have faced in teaching the issue of biological evolution. Although the challenges related to controversy in social studies and science classrooms are similar, the two bodies of literature rarely overlap. This lack of interdisciplinary dialogue seems especially problematic because each body of literature addresses significant issues related to teaching controversy with which the other discipline appears to be struggling.

Synthesis of literature

This article describes two similar, but rarely intersecting, bodies of literature. I maintain a scholarly interest in the teaching of controversial public issues in social studies classrooms, a topic on which I have published extensively (e.g., Journell, 2010, 2011a, 2011b, 2011c, 2011d, 2012; Journell, May, Stenhouse, Meyers, & Holbrook, 2012). I also searched the databases of prominent social studies education journals (*Theory and Research in Social Education*, *Journal of Social Studies Research*, *The Social Studies*, *Social Education*) for articles that mentioned biological evolution. This search uncovered two articles, Hess (2006) and Swanson (2010), that discussed evolution as a controversial public issue, but neither contained any references to science education literature.

For the science education literature, I searched the databases of prominent science education journals (*Journal of Research in Science Teaching*, *American Biology Teacher*, *International Journal of Science Education*, *Science Education*) for articles pertaining to the teaching of evolution in both K-12 and higher education contexts. Given the long history of controversy surrounding the teaching of evolution in the United States, this initial search produced an overwhelming number of articles. Since I was interested in cross-discipline discussions, I limited my search to articles with a publication date of 1980 or later, which coincides with the start of the literature base on teaching controversial public issues in social studies. This reduced the number of articles to 67, and after using citations to find other relevant articles of interest located in general education journals, I ultimately read approximately 70 articles about the teaching of evolution in science classrooms.

Controversy within social studies

Defining controversy

The theoretical basis behind the inclusion of controversial issues within the social studies curriculum is that successful participation in a democratic society requires the ability to engage in thoughtful and tolerant deliberation of public issues with others (Parker, 2003). Since students are more likely to encounter ideological perspectives at school that are more diverse than they typically find at home or in their places of worship, schools are a natural environment for this type of civic training to occur (Parker, 2010). Therefore, when engaging students in controversy, the act of discussion is as important as, if not more important than, the issue being discussed (Parker & Hess, 2001).

Despite the perceived civic importance of exposing students to controversy, understanding how students and teachers react to and learn from controversial public issues within the context of the social studies curriculum is a relatively new area of enquiry for the field. This is not to say, however, that the field is unfamiliar with controversy. For example, starting with the 'history versus social studies' debates that occurred at the turn of the previous century, the question of what should be included in the social studies curriculum has been a source of perpetual controversy (e.g., Bohan, 2003; Evans, 2007).

Yet, most of the published research on the inclusion of controversy within classroom instruction has focused on historical events. Certainly, much of documented history can be considered controversial, and research suggests that students can benefit both socially and academically from discussions of historical controversy in classroom settings (e.g., Fine, 1993). However, debating the merits of historical decisions is different than engaging students in discussions of controversial public issues, which Hess (2009) defines as 'authentic questions about the kinds of public policies that should be adopted to address public problems' (p. 5). These types of questions are almost guaranteed to elicit competing answers amongst various individuals and groups, thus making them ripe for controversy. Unlike historical controversy, however, the outcome of controversial public issues often has yet to be determined, which incites a certain type of ideological passion that can only come from being in the moment.

Hess (2009) is quick to note, however, that just because disagreements exist on a public issue it does not mean teachers should view the issue as controversial in terms of giving both sides equal weight in the classroom. Scholars from a wide range of fields have attempted to define specific criteria for determining whether issues are controversial (e.g., Hand, 2008; Johnson & Johnson, 1979), and despite slightly different wording, almost all of the definitions contain the same basic tenets: for an issue to be controversial, it needs to have multiple *rational* ways in which it can be viewed. Of course, rationality is often difficult to define, and Hess argues that it is ultimately up to the teacher to decide whether an issue meets the criteria to be considered

controversial and, thus, open to debate or whether an issue does not have sufficient evidence and should be considered ‘closed’ and not worthy of discussion.

However, just because an issue is deemed controversial does not mean it will always be considered controversial, and vice versa. Hess (2009) calls this phenomenon ‘tipping’ and argues that the controversial nature of issues is constantly changing based on new evidence or changes in social norms. For example, the question of whether interracial marriage should be legal was a controversial issue in certain regions of the United States in the early-to-middle part of the previous century. Over time, social norms changed and interracial marriages became more accepted, culminating in the *Loving v Virginia* decision in 1967 that outlawed any race-based restrictions on marriage. Presently, the idea of interracial marriages is generally considered a ‘closed’ issue in the United States, although recent polling suggests that a relatively small percentage of individuals still believe it should be illegal (Public Policy Polling, 2012). In classrooms, conflict can occur when teachers articulate a clear sense of whether an issue is open or closed and that decision contradicts with the views of their students and local communities (e.g., Washington & Humphries, 2011).

Controversy in practice

It is this potential for conflict that too often stifles discussions of controversial issues before they start. Despite strong theoretical support for the inclusion of controversial public issues within the social studies curriculum (e.g., Evans, Avery, & Pederson, 1999; Hess, 2009; Journell, 2011a; Kelly, 1986; Passe & Evans, 1996), research continues to show that teachers are hesitant to broach controversial public issues in their classrooms. Yet, research also suggests that students enjoy engaging in controversial issue discussions (e.g., Hess & Posselt, 2002), and when implemented in classrooms where ideological diversity is allowed to be respectfully articulated, research has shown that discussions of controversial issues achieve the intended goals of promoting tolerance and civic awareness (e.g., Beck, 2003; Hess, 2002; Hess & Ganzler, 2007).

If controversy can encourage student engagement with content and promote the practices of civic tolerance, the question becomes, then, why do social studies teachers shy away from incorporating controversial public issues in their classrooms? Research suggests a variety of reasons, ranging from a lack of training on how to effectively discuss controversial public issues in the classroom (Oulton, Day, Dillon, & Grace, 2004), to a lack of knowledge about controversial topics (Journell, in press), to fear of backlash from parents, administrators, and the local community (Byford, Lennon, & Russell, 2009; Hess, 2004; Journell, 2012). In her work, Hess (2002, 2004) has found that if teachers are to be successful in teaching controversy they need to be skilful in moderating classroom discussions, and they also need to feel as though they work in a school where the political climate allows them to engage in these types of discussions without fear of reproach.

Once social studies teachers commit to broaching controversy in their classes, research has shown that they often struggle with how to position themselves within the context of the subsequent classroom discussion. Although a neutrality stance has long been considered the most appropriate position for teachers to take in their classrooms (e.g., Bullough, Gitlin, & Goldstein, 1973; Elliott, 1973), there is a growing movement within the literature encouraging teachers to take what Kelly (1986) describes as a ‘committed impartiality’ stance which allows them to articulate their ideological views with the caveat that they model tolerant civic behaviour and welcome contradictory opinions from their students as equally legitimate. Those advocating a committed impartiality approach argue that students expect their adult role models, especially their social studies teachers, to have political opinions and be willing to articulate them (Kelly, 1986; Passe & Evans, 1996). Moreover, both qualitative and quantitative studies of students’ opinions on teacher disclosure suggest that students are generally in favour of teachers disclosing their opinions on political issues, even if they happen to disagree with a teacher's political stance, as long as they do not feel as though teachers are trying to force their ideological beliefs on their students (e.g., Hess & McAvoy, 2009; Journell, 2011d).

This fear of indoctrination, however, compels most social studies teachers to either avoid controversy entirely or adopt a neutrality stance in which they refuse to disclose their political opinions to their students, including during issue-based discussions (Hess, 2004). Even when confronted with the theoretical benefits of a committed impartiality stance, research has shown that some teachers still perceive neutrality as the only responsible stance for teachers to take in their classrooms (Miller-Lane, Denton, & May, 2006). Yet, there exist many examples of supposedly ‘neutral’ social studies teachers using their classroom authority to directly or indirectly posit political opinions to their students in terms of both the things that they say and the type of curriculum that they use (e.g., Journell, 2011d; Niemi & Niemi, 2007). Research has also shown that these teachers have difficulty suppressing their opinions when discussions turn to issues incorporating aspects of religion or morality (James, 2010; Journell, 2011b).

How social studies teachers respond to controversial issues that contradict their moral compasses raises significant questions about their ability to broach controversy in ways that model civic tolerance, especially in light of recent evidence that teachers’ theological certainty often trumps the democratic mindset of considering and accepting multiple points of view (James, 2010). Unfortunately, however, the lack of empirical evidence within the social studies literature base does not allow for a broad understanding of the complexities surrounding the teaching of controversial issues (Hess, 2008). Therefore, studying this topic from the perspective of science educators who have long struggled with the teaching of evolution, a controversial public issue that presents a clear conflict between religious belief and the nature of science, has the potential to further our understanding of controversy within social studies classrooms.

The evolution controversy in science

The nature of the controversy

Although many topics addressed within the science curriculum could be considered controversial (e.g., Levinson, 2006; Oulton, Dillon, & Grace, 2004), the one that has generated the most public debate over the past century is the teaching of evolution (Cobern, 1994). It is important to note that in this discussion I am not framing evolutionary theory itself as controversial. For most scientists, biological evolution is the only accepted explanation for life on Earth, and including creationist or other non-evolutionary theories in the biology curriculum is inappropriate because they promote ideas that are not supported by scientific facts. Yet, the *teaching* of evolution is a controversial public issue because of the scepticism of evolutionary theory that exists outside of the scientific community, especially amongst deeply religious individuals.

What creates conflict in terms of teaching evolution is that the fundamental principles of evolution contradict the worldview of many students and teachers, creating concern that learning a curriculum where evolution is positioned as the only rational explanation for the development of species will change the worldview of religious students who consider the will of God as the only true explanation for natural phenomena (Anderson, 2007; Cobern, 1994). As Long (2012) asks, ‘Ontologically, how can one both be a Creationist and be prepared – through education – to see evolution as plausible?’ (p. 123). In the United States and Britain, the most publicised conflicts between creationists and evolutionists involve Christian groups (e.g., Allgaier & Holliman, 2006; Long, 2012), but most faiths have a creation story that contradicts with Darwinist principles and fosters tension for educators charged with teaching evolution (e.g., Dagher & BouJaoude, 1997; Dodick, Dayan, & Orion, 2010).

Not all religious individuals, of course, discount the scientific merits of evolution. A recent study of Christian clergy in the United States, for example, found that they were more likely than secondary biology teachers to view religion and evolution as compatible, with the majority of clergy members stating that creationism should not be taught in public science classrooms (Colburn & Henriques, 2006). Yet, enough individuals take a strict interpretation of the Bible that the teaching of evolution in public education has become a controversial issue that carries educational implications at the local and national levels. In the United States, for example, former President George W. Bush voiced his support in 2005 for the inclusion of creationist or intelligent design theories to be taught alongside evolution in biology classrooms, citing that ‘part of education is to expose people to different schools of thought’ (Hess, 2006, p. 8).

The question of whether evolution should be taught in public education, therefore, is an issue that carries social, political, and scientific implications and can only be understood when discussed within social, intellectual, and pedagogical contexts (Anderson, 2007; Anderson & Kilbourn, 1983). In the United States, for example, this controversy received national attention in 1925 with the trial of *The State of Tennessee v John Scopes*, more commonly known as the ‘Scopes Monkey Trial’. Scopes, a high school science teacher, was charged with violating a state law banning the teaching of evolution in any Tennessee school. He was then found guilty in a

highly publicised trial and forced to pay a \$100 fine. Ultimately, the decision was reversed on a technicality, but the law banning the teaching of evolution in Tennessee remained on the books for another 40 years (Olasky & Perry, 2005).

Since the Scopes trial, several states and local school boards across the United States have adopted measures either banning the teaching of evolution or mandating that evolution be taught in conjunction with creationism. Even in states where evolution has been deemed appropriate for the science curriculum, many parents choose to either homeschool their children or enrol them in religious private schools in order to keep them from being exposed to instruction that contradicts their religious beliefs (Apple, 2008; Long, 2012). Evidence of this controversy can also be seen in analyses of American biology textbooks which have found coverage of evolution to not commensurate with its importance to understanding the nature of science in biology (e.g., Moody, 1996; Rosenthal, 1985; Skoog, 1984). In other nations, such as Britain, the controversy over the teaching of evolution may not have as extensive a history, but research suggests that it has become a topic of contention in recent years (e.g., Allgaier & Holliman, 2006).

Evolution in the classroom

Given the politics surrounding the teaching of evolution, it is not surprising that evolutionary theory is often treated as a controversial issue in biology classrooms. There exist multiple studies within the science literature that chronicle the challenges associated with teaching evolution in secondary and university classrooms, both in the United States and in other parts of the world. Part of this challenge is occasionally attributed to biology educators who either do not believe in evolution or openly admit to questioning evolutionary theory due to either a lack of scientific evidence or a conflict with their religious beliefs (e.g., Aguillard, 1999; BouJaoude et al., 2011; Goldston & Kyzer, 2009; Moore, 2002; Rutledge & Warden, 2000; Shankar & Skoog, 1993). Although the educators represented in these studies include a mixture of biology professors and high school teachers, a general theme that seems to permeate throughout the research is that biology professors and scientists are more accepting of evolution than secondary teachers and do not seek to try and make connections between science and religion. Secondary teachers, on the other hand, are often more sceptical of evolution, prompting some scholars to suggest that part of secondary teachers' scepticism is related to their lack of understanding of the nature of science (e.g., Dodick et al., 2010; Scharmann & Harris, 1992).

The challenge that appears to be more widespread, however, is the controversial nature of evolution as a political issue, especially for those teachers who work in politically conservative schools and communities. Again, there is an extensive literature base chronicling teachers' decisions to either avoid the topic of evolution entirely or present it in a piecemeal fashion in order to avoid going against what they perceive to be the political and cultural beliefs of parents and administrators (e.g., Brem, Ranny, & Schindel, 2003; Griffith & Brem, 2004). For example, in a recent qualitative study of three American secondary biology teachers in a Southeastern, Bible-belt state, Goldston and Kyzer (2009) found that only one was comfortable teaching

evolution. Interestingly, that teacher was the only one studied who did not live within the community surrounding the school. The other two teachers lived within the community and were both visibly uncomfortable with teaching evolution. One only spent two days on evolution, considerably shorter than her typical unit of instruction, right before the final exam, and the other, who was married to a priest, did not teach evolution at all because of her personal disbelief of evolutionary theory.

For those who view evolution as central to the nature of biological science, the idea that some teachers could ignore or marginalise evolution simply because of outside pressure or religious preference is troubling (Anderson, 2007). Recent research, therefore, has focused on ways teachers can alleviate the public controversy surrounding evolution. For example, Donnelly and Boone (2007) studied science teachers in the United States who were forced to teach evolution as part of new state biology standards. They reported that teachers found the standards helpful as a way of justifying the teaching of evolution to their students, parents, and administrators. Another study by Oliveira, Cook, and Buck (2011) found that the way in which teachers structure their classrooms plays an important role in establishing a positive classroom climate that is tolerant of diverse opinions. Finally, there exists considerable research that suggests secondary teachers, in particular, need to be better trained in how to deal with classroom controversy (e.g., Cross & Price, 1996) and more knowledgeable about both the nature of science *and* religion in order to better position evolution as compatible with students' worldviews (e.g., Dodick et al., 2010; Scharmann & Harris, 1992; Winslow, Staver, & Scharmann, 2011).

The irony surrounding teachers' trepidation toward teaching evolution is that the vast majority of studies within the science literature suggest that evolution instruction does little to change students' worldviews or attitudes toward the nature of science (e.g., Bishop & Anderson, 1990; Demastes, Settlage, & Good, 1995; Hokayem & BouJaoude, 2008), nor does students' acceptance or denial of evolution seem to affect their performance in biology courses (Ingram & Nelson, 2006). The few studies that suggest instruction can make a significant change in students' beliefs in evolution (e.g., Wiles & Alters, 2011) are exceptions to the rule. Research has found, however, that the strength of students' religious beliefs and their willingness to be open-minded toward their instruction are integral to whether they will be accepting of evolutionary theory (e.g., Deniz, Donnelly, & Yilmaz, 2008; Lawson & Warsnop, 1992; Sinatra, Southerland, McConaughy, & Demastes, 2003).

Many students, especially those who enter their biology courses with a creationist disposition, perceive their teachers' instruction as pushing an agenda, and Geddis (1991) argues that science teachers often exacerbate this perception by using their classroom authority to teach in a way that ignores the need to provide adequate evidence or make rational arguments in favour of the nature of science. As a result, many students will automatically default to preconceived worldviews without even attempting to seriously consider the scientific instruction being presented to them (Long, 2012). Anderson (2007), therefore, argues that the ultimate value of evolution instruction is not to turn students into evolutionists or even to impress upon them the importance of science

in explaining natural phenomena, but rather to use evolution as a method by which students can become more intellectually mature.

According to Anderson (2007), teachers can achieve this goal by engaging their students in conversations about what constitutes a worldview and how individuals and groups within society with competing worldviews must learn to negotiate their different understandings of reality. For this to occur, however, biology teachers must be willing to embrace students' creationist dispositions and scepticism toward science as part of a constructivist approach to teaching evolution that allows students to develop a more sophisticated understanding of both faith and science. As Cobern (1994) states, 'The mistake in science education has been to go one step further and act as though belief were not an issue' (p. 587).

Learning from each other

Based on the literature in both fields, it is apparent that science and social studies teachers face similar challenges in teaching evolution and controversial public issues, respectively. As such, one would expect to see a fair amount of consistency in how science and social studies scholars define and discuss controversy in their respective research, but that is far from the case. When analysing these two literature bases, I found little overlap in terms of social studies scholars citing literature pertaining to teaching evolution, and vice versa (Oliveira et al., 2011 being a notable exception). This lack of communication between the two disciplines is disappointing because it seems as though each would benefit from an analysis of the research and theory offered by the other.

From a social studies standpoint, the field would certainly benefit from the extensive empirical evidence offered from the research on teaching evolution. As noted earlier, the teaching of controversial public issues is a relatively new subfield of social studies, and to date, much of what has been written about controversy in social studies has been based on theoretical constructs as opposed to empirical data (Hess, 2008). Of particular interest to social studies scholars would be the research detailing how biology teachers respond to the pressure of teaching a topic that goes against the grain of the school and community political climate. Better understanding how teachers can navigate these concerns seems especially important for social studies teachers in ideologically and racially homogeneous environments where recent research has found that teachers may avoid discussions of civic and political topics for fear of appearing to stand in the political minority (Jacobsen, Frankenberg, & Lenhoff, 2012; Journell, 2012).

The other lesson social studies scholars can take from the literature on teaching evolution is a better understanding of how faith can influence both teachers' pedagogical stances and students' willingness to accept progressive civic instruction. A social justice orientated approach to civic education is sure to clash with some students' and teachers' worldviews, especially when politics becomes intertwined with religion. Recent research has shown that even teachers who pride themselves on teaching for ideological diversity have difficulty maintaining that stance when

their religious beliefs are challenged (Journell, 2011b). However, instead of avoiding potential conflict when this type of issue is raised, as many social studies teachers are prone to do (Hess, 2004), I believe teachers would be well advised to heed the advice of Anderson (2007) and others in science who advocate discussing conflicting worldviews openly.

For example, one of the interventions that seemed to make students more accepting of evolution was to have openly religious faculty members talk to students about how belief in evolution did not necessarily have to conflict with their faith. Implementing a similar strategy within social studies methods courses, for example, may aid preservice and practising teachers who find themselves conflicted between promoting civic equality and certain faith-based public issues, such as the recent debates over gay marriage in the United States. Moreover, social studies educators often do not take the time to educate themselves on the beliefs of their ardently religious students. If there is one lesson that the field of social studies can take from the literature on teaching evolution it is that students became much more tolerant of divergent beliefs on evolution when their teachers were knowledgeable about both evolution *and* religion and could reconcile the two worldviews.

As someone outside the field of science, I hesitate to make too many recommendations about what science can learn from research on the teaching of controversial public issues; however, as I read through the science literature, I was struck by the lack of consistent definitions about how to define whether issues were controversial. Those who study the teaching of evolution would benefit from Hess's (2009) definition of what constitutes a controversial issue, especially her discussion of how issues can 'tip' from being controversial to non-controversial over time. Certainly, evolution was controversial when Darwin published his theories in the mid-1800s, but at what point, however, does evolution tip the other way and cease to be controversial in light of indisputable scientific evidence? I do not profess to know the answer to that question, but the larger point is that Hess would argue that an issue does not necessarily have to be presented as controversial if only a relatively small number of individuals disagree with the legitimacy of a particular stance.

The other aspect of the controversial public issue literature that was missing from the literature on evolution was the impact of teacher disclosure on classroom instruction. I found disclosure to be only mentioned in passing (e.g., Cross & Price, 1996; Oliveira et al., 2011), but based on the teacher disclosure research within the social studies literature, it seems that whether teachers disclose their opinion on the legitimacy of evolution would impact their students' ability to distinguish between scientific fact and teacher opinions. Given the natural authority of teachers in classrooms, if teachers do not disclose their opinions then what they say on the topic of evolution will likely come across as fact. Based on studies of biology classrooms, if teachers approach evolution as an infallible theory without acknowledging contrarian worldviews, their ardently religious students may shut down because they feel as though their beliefs are not being taken seriously.

Science teachers, therefore, would benefit from taking a committed impartiality stance (Kelly, 1986) when discussing evolution. This approach would allow them to articulate their view of evolution as an accepted theory based on scientific fact, but simultaneously acknowledge that many individuals outside of the scientific community may view evolution differently. This is not to say that teachers have to frame creationism or intelligent design as rational alternatives to evolutionary theory or give them equal instructional time, but being able to acknowledge the beliefs of all students may promote tolerant classrooms where even ardently religious students can view evolution with an open mind. A committed impartiality approach seems especially appropriate for teachers who heed Anderson's (2007) advice and engage students in general discussions of competing worldviews prior to delving into discussions of evolutionary theory.

Implications for research and practice

Comparing the teaching of controversial public issues in social studies and evolution in science is not perfect. For example, discussions of controversial public issues may be fleeting and most will eventually resolve themselves once policy decisions are made. Perhaps more importantly, social studies teachers should want a variety of perspectives on any given issue. Evolution, on the other hand, is central to biology education and, as such, teachers may not wish to seriously explore alternative viewpoints.

When one looks at each discipline from the perspective of broaching controversy within the curriculum, however, there is much to compare. For example, both social studies and biology teachers must balance the tenets of their respective disciplines within the context of the political climate of their schools and surrounding communities. Yet, scholars in each discipline appear to have largely ignored the valuable lessons they could glean from research on challenges teachers have faced in similar contexts, even if those experiences occurred while teaching different content.

Awareness of how teachers in other disciplines broach curricular controversy is a first step to a more nuanced understanding of how to navigate the political contexts of schools and communities. Yet, given that social studies and science curricula (or any two content disciplines, for that matter) will never be exactly the same, awareness can only go so far. At some point, teachers and scholars need to put this awareness into practice. Aspects of cross-disciplinary practices, such as science teachers adopting a committed impartiality stance toward the teaching of evolution or social studies teachers merging faith within discussions of controversial public issues, need to be empirically evaluated and, if successful, implemented into our ways of teaching and learning in those respective disciplines.

Ideally, this increased awareness would lead to truly integrative interdisciplinary approaches to essential questions surrounding the tenets of each discipline's respective curricula (Klein, 2005). Consider, for example, the possibilities afforded by preservice social studies and science teachers grappling with the question of how best to navigate the political contexts of schooling within a

methods course co-taught by curricular experts in each discipline. Given the shared challenges of science and social studies teachers outlined in this article, we are doing our preservice teachers a disservice by not providing them with a well-rounded understanding of appropriate responses to curricular controversy.

Similarly, it is easy to imagine an integrated K-12 curriculum in which aspects of curricular controversy, such as the teaching of evolution, are addressed from an interdisciplinary perspective. Students in social studies courses could discuss the teaching of evolution as a controversial public issue in which a variety of opinions are warranted, while in science classes teachers could have these same students view evolution as an unquestionable tenet of biological thought. This type of juxtaposition would serve to better define how the controversial nature of an issue can change due to context. Such an understanding would extend beyond the isolated issue of evolution to the inevitable political, moral, or religious controversies that will occur throughout students' lives whenever two seemingly irreconcilable worldviews collide.

Conclusion

Although the example presented in this article is specific to classroom controversy in science and social studies, I use it to make the case for an increased awareness of research and practice in other disciplines. Again, the most surprising aspect of this exercise was discovering that despite having faced fundamentally similar challenges with respect to controversy, there was nary a word written in each discipline's respective literature about how this issue has been handled in other contexts. In this day and age, with information more accessible than at any other point in history, there is no excuse for scholars and practitioners to work in isolation. Our work and, more importantly, those who ultimately profit from the knowledge we create will benefit if we are able to expand our own disciplinary worldviews and learn from the rich expertise of others.

References

1. Aguillard, D. 1999. Evolution education in Louisiana's public schools: A decade following *Edwards v Aguillard*. *American Biology Teacher*, 61: 182–188. doi:10.2307/4450650
2. Allgaier, J. and Holliman, R. 2006. The emergence of the controversy around the theory of evolution and creationism in UK newspaper reports. *Curriculum Journal*, 17: 263–279. doi:10.1080/09585170600909738
3. Anderson, R. D. 2007. Teaching the theory of evolution in social, intellectual, and pedagogical context. *Science Education*, 91: 664–677. doi:10.1002/sce.20204
4. Anderson, T. and Kilbourn, B. 1983. Creation, evolution, and curriculum. *Science Education*, 67: 45–55. doi:10.1002/sce.3730670108
5. Apple, M. W. 2008. Evolution versus creationism in education. *Educational Policy*, 22: 327–335. doi:10.1177/0895904807312466

- 6.** Beck, T. A. 2003. If he murdered someone, he should get a lawyer”: Engaging young children in civics deliberation.. *Theory and Research in Social Education*, 31: 326–346. doi:10.1080/00933104.2003.10473228
- 7.** Bishop, B. A. and Anderson, C. W. 1990. Student conceptions of natural selection and its role in evolution. *Journal of Research in Science Teaching*, 27: 415–427. doi:10.1002/tea.3660270503
- 8.** Bohan, C. A. 2003. Early vanguards of progressive education: The committee of ten, the committee of seven, and social education. *Journal of Curriculum and Supervision*, 19: 73–94.
- 9.** BouJaoude, S., Asghar, A., Wiles, J. R., Jaber, L., Sarieedine, D. and Alters, B. 2011. Biology professors’ and teachers’ positions regarding biological evolution and evolution education in a Middle Eastern society. *International Journal of Science Education*, 33: 979–1000. doi:10.1080/09500693.2010.489124
- 10.** Brem, S. K., Ranney, M. and Schindel, J. 2003. Perceived consequences of evolution: College students perceive negative personal and social impact in evolutionary theory. *Science Education*, 87: 181–206. doi:10.1002/sci.10105
- 11.** Bullough, R. V., Gitlin, A. and Goldstein, S. 1984. Ideology, teacher role, and resistance. *Teachers College Record*, 86: 339–358.
- 12.** Byford, J., Lennon, S. and Russell, W. B. 2009. Teaching controversial issues in the social studies: A research study of high school teachers. *Clearing House*, 82: 165–170. doi:10.3200/TCHS.82.4.165-170
- 13.** Cobern, W. W. 1994. Point: Belief, understanding, and the teaching of evolution. *Journal of Research in Science Teaching*, 31: 583–590. doi:10.1002/tea.3660310511
- 14.** Colburn, A. and Henriques, L. 2006. Clergy views on evolution, creationism, science, and religion. *Journal of Research in Science Teaching*, 43: 419–442. doi:10.1002/tea.20109
- 15.** Cross, R. T. and Price, R. F. 1996. Science teachers’ social conscience and the role of controversial issues in the teaching of science. *Journal of Research in Science Teaching*, 33: 319–333. doi:10.1002/(SICI)1098-2736(199603)33:3<319::AID-TEA5>3.0.CO;2-W
- 16.** Dagher, Z. R. and BouJaoude, S. 1997. Scientific views and religious beliefs of college students: The case of biological evolution. *Journal of Research in Science Teaching*, 34: 429–445. doi:10.1002/(SICI)1098-2736(199705)34:5<429::AID-TEA2>3.0.CO;2-S
- 17.** Demastes, S. S., Settlage, J. and Good, R. 1995. Students’ conceptions of natural selection and its role in evolution: Cases of replication and comparison. *Journal of Research in Science Teaching*, 32: 535–550. doi:10.1002/tea.3660320509

- 18.** Deniz, H., Donnelly, L. A. and Yilmaz, I. 2008. Exploring the factors related to acceptance of evolutionary theory among Turkish preservice biology teachers: Toward a more informative conceptual ecology for biological evolution. *Journal of Research in Science Teaching*, 45: 420–443. doi:10.1002/tea.20223
- 19.** Dodick, J., Dayan, A. and Orion, N. 2010. Philosophical approaches of Jewish science teachers toward the teaching of ‘controversial’ topics in science. *International Journal of Science Education*, 32: 1521–1548. doi:10.1080/09500690903518060
- 20.** Donnelly, L. A. and Boone, W. J. 2007. Biology teachers’ attitudes toward and use of Indiana's evolution standards. *Journal of Research in Science Teaching*, 44: 236–257. doi:10.1002/tea.20150
- 21.** Elliott, J. 1973. Neutrality, rationality and the role of the teacher. *Journal of Philosophy of Education*, 7(1): 39–65. doi:10.1111/j.1467-9752.1973.tb00472.x
- 22.** Evans, R. W. 2007. *This happened in America: Harold Rugg and the censure of social studies*, Charlotte: NC: Information Age.
- 23.** Evans, R. W., Avery, P. G. and Pederson, P. V. 1999. Taboo topics: Cultural restraint on teaching social issues. *Social Studies*, 90: 218–224. doi:10.1080/00377999909602419
- 24.** Fine, M. 1993. You can't just say that the only ones who can speak are those who agree with your position”: Political discourse in the classroom.. *Harvard Educational Review*, 63: 412–434.
- 25.** Geddis, A. N. 1991. Improving the quality of science classroom discourse on controversial issues. *Science Education*, 75: 169–183. doi:10.1002/sce.3730750203
- 26.** Goldston, M. J. and Kyzer, P. 2009. Teaching evolution: Narratives with a view from three southern biology teachers in the USA. *Journal of Research in Science Teaching*, 46: 762–790. doi:10.1002/tea.20289
- 27.** Griffith, J. A. and Brem, S. K. 2004. Teaching evolutionary biology: Pressures, stress, and coping. *Journal of Research in Science Teaching*, 41: 791–809. doi:10.1002/tea.20027
- 28.** Hand, M. 2008. What should we teach as controversial? A defense of the epistemic criterion. *Educational Theory*, 58: 213–228. doi:10.1111/j.1741-5446.2008.00285.x
- 29.** Hess, D. 2008. “Controversial issues and democratic discourse”. In *Handbook of research in social studies education*, Edited by: Levstik, L. S. and Tyson, C. A. 124–136. New York, NY: Routledge.
- 30.** Hess, D. and Ganzler, L. 2007. “Patriotism and ideological diversity in the classroom”. In *Pledging allegiance: The politics of patriotism in America's schools*, Edited by: Westheimer, J. 131–138. New York, NY: Teachers College Press.

31. Hess, D. and Posselt, J. 2002. How high school students experience and learn from the discussion of controversial public issues. *Journal of Curriculum and Supervision*, 17: 283–314.
32. Hess, D. E. 2002. Discussing controversial public issues in secondary social studies classrooms: Learning from skilled teachers. *Theory and Research in Social Education*, 30: 10–41. doi:10.1080/00933104.2002.10473177
33. Hess, D. E. 2004. Controversies about controversial issues in democratic education. *PS: Political Science & Politics*, 37: 257–261. doi:10.1017/S1049096504004196
34. Hess, D. E. 2006. Should intelligent design be taught in social studies courses?. *Social Education*, 70: 8–13.
35. Hess, D. E. 2009. *Controversy in the classroom: The democratic power of discussion*, New York, NY: Routledge.
36. Hess, D. E. and McAvoy, P. 2009. “To disclose or not to disclose: A controversial choice for teachers”. In *Controversy in the classroom: The democratic power of discussion*, Edited by: Hess, D. E. 97–110. New York, NY: Routledge.
37. Hokayem, H. and BouJaoude, S. 2008. College students’ perceptions of the theory of evolution. *Journal of Research in Science Teaching*, 45: 395–419. doi:10.1002/tea.20233
38. Ingram, E. L. and Nelson, C. E. 2006. Relationship between achievement and students’ acceptance of evolution or creation in an upper-level evolution course. *Journal of Research in Science Teaching*, 43: 7–24. doi:10.1002/tea.20093
39. Jacobsen, R., Frankenberg, E. and Lenhoff, S. W. 2012. Diverse schools in a democratic society: New ways of understanding how school demographics affect civic and political learning. *American Educational Research Journal*, 49: 812–843. doi:10.3102/0002831211430352
40. James, J. H. 2010. Democracy is the devil's snare”: Theological certainty in teacher education.. *Theory and Research in Social Education*, 38: 618–639. doi:10.1080/00933104.2010.10473441
41. Johnson, D. W. and Johnson, R. 1979. Conflict in the classroom: Controversy and learning. *Review of Educational Research*, 49: 51–68. doi:10.3102/00346543049001051
42. Journell, W. 2010. The influence of high-stakes testing on high school teachers’ willingness to incorporate current political events into the curriculum. *High School Journal*, 93: 111–125. doi:10.1353/hsj.0.0048
43. Journell, W. 2011a. Staying civil. *Educational Leadership*, 68(6) Retrieved from <http://www.ascd.org/publications/educational-leadership/mar11/vol68/num06/Staying-Civil.aspx>

44. Journell, W. 2011b. Teachers' controversial issue decisions related to race, gender, and religion during the 2008 Presidential election. *Theory and Research in Social Education*, 39: 348–392. doi:10.1080/00933104.2011.10473459
45. Journell, W. 2011c. The challenges of political instruction in a post-9/11 United States. *High School Journal*, 95: 3–14. doi:10.1353/hsj.2011.0018
46. Journell, W. 2011d. The disclosure dilemma in action: A qualitative look at the effect of teacher disclosure on classroom instruction. *Journal of Social Studies Research*, 35: 217–244.
47. Journell, W. 2012. Ideological homogeneity, school leadership, and political intolerance in secondary education: A study of three high schools during the 2008 Presidential election. *Journal of School Leadership*, 22: 569–599.
48. Journell, W. in press. What preservice social studies teachers (don't) know about politics and current social issues – and why it matters. *Theory and Research in Social Education*,
49. Journell, W., May, L. A., Stenhouse, V. L., Meyers, L. E. and Holbrook, T. 2012. Scaffolding classroom discourse in an election year: Keeping a cool mood in a heated season. *Social Studies and the Young Learner*, 25: 6–9.
50. Kelly, T. E. 1986. Discussing controversial issues: Four perspectives on the teacher's role. *Theory and Research in Social Education*, 14: 113–138. doi:10.1080/00933104.1986.10505516
51. Klein, J. T. 2005. Integrative learning and interdisciplinary studies. *Peer Review*, 7(4): 8–10.
52. Lawson, A. E. and Worsnop, W. A. 1992. Learning about evolution and rejecting a belief in special creation: Effects of reflective reasoning skill, prior knowledge, prior belief and religious commitment. *Journal of Research in Science Teaching*, 29: 143–166. doi:10.1002/tea.3660290205
53. Levinson, R. 2006. Towards a theoretical framework for teaching controversial socio-scientific issues. *International Journal of Science Education*, 28: 1201–1224. doi:10.1080/09500690600560753
54. Long, D. E. 2012. The politics of teaching evolution, science evolution standards, and being a creationist. *Journal of Research in Science Teaching*, 49: 122–139. doi:10.1002/tea.20445
55. Miller-Lane, J., Denton, E. and May, A. 2006. Social studies teachers' views on committed impartiality and discussion. *Social Studies Research and Practice*, 1: 30–44.
56. Moody, D. E. 1996. Evolution and the textbook structure of biology. *Science Education*, 80: 395–418. doi:10.1002/(SICI)1098-237X(199607)80:4<395::AID-SCE2>3.0.CO;2-8

57. Moore, R. 2002. Teaching evolution: Do state standards matter?. *BioScience*, 52: 378–381. doi:10.1641/0006-3568(2002)052[0378:TEDSSM]2.0.CO;2
58. Niemi, N. S. and Niemi, R. G. 2007. Partisanship, participation, and political trust as taught (or not) in high school history and government classes. *Theory and Research in Social Education*, 35: 32–61. doi:10.1080/00933104.2007.10473325
59. Olasky, M. and Perry, J. 2005. *Monkey business: The true story of the Scopes trial*, Nashville: TN: Broadman & Holman.
60. Oliveira, A. W., Cook, K. and Buck, G. A. 2011. Framing evolution instruction intellectually. *Journal of Research in Science Teaching*, 48: 257–280. doi:10.1002/tea.20396
61. Oulton, C., Day, V., Dillon, J. and Grace, M. 2004. Controversial issues – teachers’ attitudes and practices in the context of citizenship education. *Oxford Review of Education*, 30: 489–507. doi:10.1080/0305498042000303973
62. Oulton, C., Dillon, J. and Grace, M. 2004. Reconceptualizing the teaching of controversial issues. *International Journal of Science Education*, 26: 411–423. doi:10.1080/0950069032000072746
63. Parker, W. C. 2003. *Teaching democracy: Unity and diversity in public life*, New York, NY: Teachers College Press.
64. Parker, W. C. 2010. Listening to strangers: Classroom discussion in democratic education. *Teachers College Record*, 112: 2815–2832.
65. Parker, W. C. and Hess, D. E. 2001. Teaching with and for discussion. *Teaching and Teacher Education*, 17: 273–289. doi:10.1016/S0742-051X(00)00057-3
66. Passe, J. and Evans, R. W. 1996. “Discussion methods in an issues-centered curriculum”. In *Handbook on teaching social issues*, Edited by: Evans, R. W. and Saxe, D. W. 81–88. Washington, DC: National Council for the Social Studies.
67. Public Policy Polling. 2012. *Very close race in both Alabama and Mississippi* Retrieved from http://www.publicpolicypolling.com/pdf/2011/PPP_Release_SouthernSwing_312.pdf
68. Rosenthal, D. B. 1985. Evolution in high school biology textbooks: 1963–1983.. *Science Education*, 69: 637–648. doi:10.1002/sci.3730690506
69. Rutledge, M. L. and Warden, W. A. 2000. Evolutionary theory, the nature of science, and high school biology teachers: Critical relationship. *American Biology Teacher*, 62: 23–32. doi:10.1662/0002-7685(2000)062[0023:ETTNOS]2.0.CO;2

- 70.** Scharmann, L. C. and Harris, W. M. 1992. Teaching evolution: Understanding and applying the nature of science. *Journal of Research in Science Teaching*, 29: 375–388. doi:10.1002/tea.3660290406
- 71.** Shankar, G. and Skoog, G. D. 1993. Emphasis given evolution and creationism by Texas high school biology teachers. *Science Education*, 77: 221–233. doi:10.1002/sce.3730770209
- 72.** Sinatra, G. M., Southerland, S. A., McConaughy, F. and Demastes, J. W. 2003. Intentions and beliefs in students' understanding and acceptance of biological evolution. *Journal of Research in Science Teaching*, 40: 510–528. doi:10.1002/tea.10087
- 73.** Skoog, G. 1984. The coverage of evolution in high school biology textbooks published in the 1980s. *Science Education*, 68: 117–128. doi:10.1002/sce.3730680205
- 74.** Swanson, H. 2010. Teaching Darwin: Contemporary social studies through controversial issues. *Journal of Social Studies Research*, 34: 153–174.
- 75.** Tyson, C., Mayo, J. B., Ho, L., Hahn, C., Barton, K., James, J. H. and Salinas, C. 2011. Can we move beyond scholarship that is “weak, isolated, and incestuous”? Creating a more viable future for social studies research. Panel discussion at the annual meeting of the College and University Faculty Assembly of the National Council for the Social Studies. December 2011, Washington, DC.
- 76.** Washington, E. Y. and Humphries, E. K. 2011. A social studies teacher's sense making of controversial issues discussions of race in a predominately white, rural high school classroom. *Theory and Research in Social Education*, 39: 92–114. doi:10.1080/00933104.2011.10473448
- 77.** Wiles, J. R. and Alters, B. 2011. Effects of an educational experience incorporating an inventory of factors potentially influencing student acceptance of biological evolution. *International Journal of Science Education*, 33: 2559–2585. doi:10.1080/09500693.2011.565522
- 78.** Winslow, M. W., Staver, J. R. and Scharmann, L. C. 2011. Evolution and personal religious belief: Christian university biology-related majors' search for reconciliation. *Journal of Research in Science Teaching*, 48: 1026–1049. doi:10.1002/tea.20417