ABSTRACT

Despite frequent litigious interactions between science and religion, when it comes to the teaching of evolution, relatively little is known about public school teachers’ understanding of the associated legal issues. The present study expands on Moore’s (2004) survey by obtaining more information about respondents, surveying teachers from multiple states, including teachers of all grade levels, and including “I don’t know” as an option on the original survey developed by Moore. The survey was completed by 208 teachers from 42 states. Findings include a detailed portrait of teachers’ understanding of evolution-related laws and the time they devote to teaching evolution. Our results indicate that the majority of surveyed teachers devote >13 hours of instruction per class semester to evolution and teach evolution either as a unifying theme throughout the class or as a unit of instruction. The responses indicate that a majority of the teachers surveyed possess a sufficient understanding of legal issues but lack a sufficient understanding of the more nuanced aspects of evolution case law. The findings indicate the need for improved preservice and inservice instruction that addresses evolution case law, emphasizing the legal parameters that teachers should adhere to when teaching evolution.

Key Words: evolution; law; K–12 teachers.

Introduction

Despite frequent litigious interactions between science and religion, when it comes to the teaching of evolution, relatively little is known about public school teachers’ understanding of the associated legal issues. Challenges to the teaching of evolution in public school science classes have proliferated since the Scopes Trial (Hermann, 2008). Moreover, the history of case law indicates that each new ruling often results in opponents devising new strategies for dismantling evolution instruction (Binns, 2013). Anti-evolution challenges have taken on many forms over the past few decades, including “creation science,” “intelligent design,” and “academic freedom” legislation (Binns, 2013). At the secondary level, where the theory of evolution is expected to be taught in most states, science teachers continue to report that they avoid instruction on evolution or teach potentially unconstitutional alternatives to evolution (Berkman & Plutzer, 2011).

Many teachers may not be fully aware of the extent to which their classroom practices are in accordance with the legal parameters related to the teaching of evolution (Moore, 2004). In 2004, Moore reported the results of a survey of 103 high school biology teachers from Minnesota. He found that overall, these teachers had a good understanding of the legal issues associated with teaching evolution and creationism, though 27% believed they had the choice to teach creationism in the science curriculum. Further, 29% of the teachers thought it was still a crime to teach evolution in some parts of the United States. There has been little research on teachers’ understanding of legal aspects of evolution since Moore’s publication. As part of a multifaceted study, Vaughn and Robbins (2017) found a shift in preservice teachers’ opinions after an introductory biology course in which they were required to read and write about relevant Supreme Court cases. The preservice teachers’ views became significantly

“Knowing what legally can and cannot be done when teaching evolution can inform teachers’ practice and help them navigate conversations with students either individually or in groups.”

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more supportive of the teaching of evolution, but the authors did not measure their understanding of evolution-related legal cases.

Studies of legal issues surrounding the teaching of evolution have largely been limited to biology teachers or biology courses at the middle and high school levels. However, salient aspects of evolutionary theory are found in science classes from elementary school through high school. Teaching out of field is a general problem for science teachers, with a recent study indicating that only 36% of new science teachers are teaching only in their primary field of study (Nixon et al., 2017). Many of those teaching evolution may not have completed a life science or biology major. At the elementary level, 34% of teachers have taken courses in life, earth, and physical sciences; at the middle school level, 40% of life science/biology teachers have a degree in the field; and at the high school level, 63% of life science/biology teachers have a degree in the field (Banilower et al., 2018). The prevalence of teaching out of field may indicate that many life science/biology teachers have not had the opportunity to complete course work emphasizing evolution, evolution-specific pedagogy, or the legal aspects of teaching evolution.

The present study explores K–12 teachers’ current views on teaching evolution and their knowledge of legal cases. Since Moore’s (2004) study, there have been additional challenges to the teaching of evolution and, hence, additional media coverage of the topic. Thus, teachers may be more aware of the legal issues than they were 15 years ago. Our primary purpose here is to provide a snapshot of the current state of evolution teaching across the nation. Thus, we explored the amount of time teachers devote to teaching evolution and the extent to which that may be related to their understanding of evolution-related laws. We also explored differences in understanding of those laws in relation to years of teaching experience. Finally, we explored differences in understanding of evolution-related laws among elementary, middle, and high school teachers.

Study Design

We began by developing a survey that expands upon the one developed by Moore (2004). The survey contains a total of 32 questions, including 20 related to case law; other questions ask in what state or territory the respondent teaches, what the participant teaches and at what grade level, whether they teach life science/biology topics and the time they devote to evolution-related topics, and (as a follow-up) why they do not teach evolution. Nineteen of the 20 questions assessing participants’ knowledge of legal aspects of teaching evolution are taken from Moore’s (2004) survey. We removed Moore’s question “If the government uses tax money to produce public exhibits that promote evolution, must it also provide funds to produce exhibits that promote creationism?” because it seemed to be outside the realm of the classroom teacher. In its place we added question 20 (“Is teaching intelligent design unconstitutional?”), about the decision in Kitzmiller v. Dover Area School District, a case decided a year after Moore’s publication.

We sent a draft of our survey to four teachers (two high school, one middle school, and one elementary) to solicit feedback. On the basis of comments and suggestions from these four teachers, we revised several questions and answer choices. One of the most notable changes was the inclusion of “I don’t know” as a response for the legal questions, whereas Moore’s original survey included only “Yes” and “No” options. The logic behind this change is that some teachers simply didn’t know an answer and told us they would be guessing.

We disseminated the final version of our survey online as a Google form that was blinded so that we did not have the ability to identify or follow up with respondents. We sought to obtain a national sample of K–12 public school teachers, whereas Moore’s original study was focused on high school biology teachers in the state of Minnesota. We solicited K–12 teachers’ participation in a variety of ways. Individual messages were sent to program alumni encouraging them to complete the survey and disseminate it among their colleagues. We also posted messages about the survey on several social media pages related to teaching science generally or biology specifically. We also posted recruitment messages to the elementary-specific and biology-specific listservs of the National Science Teachers Association and an NGSS biology Facebook page with >7000 members. Our recruitment message stated that we “are interested in learning more about the instructional approaches used by teachers and the extent to which teachers are informed about legal issues related to teaching evolution.” While we encouraged all K–12 public school teachers to complete the survey, one limitation of this approach is that it may have minimized the number of responses we received from teachers who do not teach evolution. However, this limitation likely existed for other, similar studies. For example, Berkman et al. (2008) had a 48% response rate for their 2007 survey, which contained questions about teaching evolution and personal attitudes toward evolution and creationism. Similarly, Rutledge and Mitchell (2002) had a 56% response rate for their survey, which included items about teaching evolution and academic background. A response rate of 50–56% could similarly result in a sample of participants more inclined to teach evolution. In each of these studies and the present study, some teachers who avoid evolution or teach alternatives did respond to the survey. However, our sample may be biased toward including teachers who are more inclined to teach evolution, given their willingness to respond to a survey about teaching evolution. Despite this limitation, in our sample of teachers, 9.5% either avoid teaching evolution or teach alternatives to evolution. The survey was limited to K–12 public school teachers in the United States. We received 212 responses, but two were blank and two others were from teachers who were not teaching a class that would include evolution as a topic, leaving 208 teachers who have completed the survey.

Results

As noted, this study expands on Moore’s (2004) work by sampling K–12 public school teachers across the United States. The teachers who responded to the survey teach in public schools in 42 states. The states most highly represented are Maryland (21), California (20), and Illinois (10), with the remaining states each represented by nine or fewer teachers. Thirty-four teachers were located in the Southeast, where fundamentalist religious beliefs are common (Goldston & Kyzer, 2009). The majority of the 208 respondents, 65.8%, teach high school; 17.1% teach middle school; and the remaining 17.1% teach elementary school. The respondents represent a range of teaching experience, including 20.8% who have
taught for 11–15 years, 19.8% who have taught for 6–10 years, 16.4% who have taught for 3–5 years, 13.9% who have taught for 16–20 years, and 8.7% who have taught for ≥31 years. Only 4.3% of the respondents have taught for ≤2 years.

When asked how much time per semester they devote to teaching evolution, the clear majority, 41.3%, indicated that they devote ≥17 hours of instructional time to teaching evolution, followed by 18.9% who reported devoting 13–16 hours; 8.3% reported devoting no time to teaching evolution; 6% reported allocating 2–4 hours; and 4% reported allocating less than an hour to the topic. Among those who do not teach evolution, 17.9% indicated that it is not in the curriculum, 1.8% said they want to minimize or avoid conflict, and 0.9% cover the topic but do not refer to it as evolution.

Most of the teachers surveyed (48.3%) indicated that evolution is a unifying topic throughout the course, whereas 31.8% teach evolution as a unit like any other topic, 9.0% do not cover evolution, and 10.9% use phrases like “change over time” instead of “evolution.”

The modified Moore (2004) survey is reliable with our population of teachers (Chronbach’s α = 0.740). For the 20 questions on evolution-related law (Table 1), an average of 60.82% of the responses were correct, 10.68% were incorrect, and 28.50% indicated that the teacher did not know the answer to the question. Among his sample of Minnesota biology teachers, Moore found that an average of 78.45% of the questions were answered correctly. The lower rate of correct responses in our sample may be due to the broader (42-state) region covered, the broader sample population of K–12 teachers, and the inclusion of “I don’t know” as a response choice.

Table 1. Percentage of survey participants who chose each of the three possible responses to questions about legal issues related to the teaching of evolution (asterisk indicates correct response).

| Question & Supporting Case Law                                                | Yes   | No     | I Don't Know |
|-------------------------------------------------------------------------------|-------|--------|--------------|
| 1. Must science teachers who teach evolution give equal time to creationism? | 2.9   | 88.3*  | 8.7          |
| (McLean v. Arkansas Board of Education, 529 F. Supp. 1255 [E.D. Ark. 1982]; Edwards v. Aguillard, 482 U.S. 578 [1987]; Daniel v. Waters, 515 F. 2d 485 [6th Cir. 1975]) |       |        |              |
| 2. Can science teachers who teach evolution give equal time to creationism? | 10.3  | 72.5*  | 17.2         |
| (McLean v. Arkansas Board of Education, 529 F. Supp. 1255 [E.D. Ark. 1982]; Edwards v. Aguillard, 482 U.S. 578 [1987]) |       |        |              |
| 3. Is it still a crime to teach evolution anywhere in the United States today? | 13.3  | 35.3*  | 51.2         |
| (Epperson v. Arkansas, 393 U.S. 97 [1968]; Wright v. Houston Independent School District, 366 F. Supp. 1208 [S.D. Tex. 1972], aff’d, 486 F.2d 137 [5th Cir. 1973], cert. denied sub. nom.; Brown v. Houston Independent School District, 417 U.S. 969 [1974]) |       |        |              |
| 4. Students and their parents claim that evolution offends and is incompatible with their religious beliefs. Must teachers modify their teaching to accommodate the student’s right to religious freedom? | 5.8   | 77.7*  | 16.5         |
| (Wright v. Houston independent School District, 366 F. Supp. 1208 [S.D. Tex. 1972], aff’d, 486 F2d 137 [5th Cir. 1973], cert. denied sub. nom.; Burstyn v. Wilson, 343 U.S. 495, 505 [1952]; Epperson v. Arkansas, 393 U.S. 97 [1968]) |       |        |              |
| 5. Can the government use tax money to promote the teaching of evolution?     | 70.2* | 6.3    | 23.4         |
| (Willoughby v. Stever, Civil Action no. 1574-72 [D.D.C. 25 August 1972], aff’d mem., 504 R2d 271 [D.C. Cir. 1974], cert. denied, 420 U.S. 927 [1975]) |       |        |              |
| 6. If the government uses tax money to produce science textbooks that promote evolution, must it also provide funds to promote textbooks that promote creationism? | 3.9   | 84.1*  | 12.1         |
| (Willoughby v. Stever, Civil Action no. 1574-72 [D.D.C. 25 August 1972], aff’d mem., 504 R2d 271 [D.C. Cir. 1974], cert. denied, 420 U.S. 927 [1975]) |       |        |              |
| Question & Supporting Case Law                                                                 | Yes  | No   | I Don’t Know |
|------------------------------------------------------------------------------------------------|------|------|--------------|
| 7. Does the First Amendment right to free speech entitle teachers to teach creationism in the science classes of public schools? (Webster v. New Lenox School District #122, 917 F 2d 1004 [7th Cir. 1990]; Bishop v. Aronov, 926 F2d 1066,1077 [11th Cir. 1991];Hellend v. South Bend Community School Corporation, 93 F3d 327 [7th Cir. 1996], cert. denied, 519 U.S. 1092 [1997]) | 8.7  | 72.5* | 18.8         |
| 8. Has the court determined that creation science has no scientific merit? (McLean v. Arkansas, Board of Education, 529 F Supp. 1255 [E.D. Ark 1982]) | 34.3*| 11.1  | 54.6         |
| 9. Students, their parents, school administrators, and other local residents all want a teacher to teach evolution and creationism in her science class. If these people want the teacher to teach evolution and creationism, can the teacher teach them both? (McLean v. Arkansas Board of Education, 529 F Supp. 1255 [E.D. Ark 1982]; Edwards v. Aguillard, 482 U.S. 578 [1987]) | 15.5 | 59.4* | 25.1         |
| 10. Can a school district force a teacher to stop teaching creationism? (Webster v. New Lenox School District #122, 917 F2d 1004 [7th Cir. 1990]) | 68.1*| 3.9   | 28.0         |
| 11. Can a school require that a teacher teach evolution? (Peloza v. Capistrano Unified School District, 37 F3d 517 [9th Cir. 1994]) | 85.4*| 1.0   | 13.7         |
| 12. Has the U.S. Supreme Court endorsed the teaching of "evidence against evolution”? (Edwards v. Aguillard, 482 U.S. 578 [1987]; the minority opinion mentions “whatever scientific evidence there may be against evolution”) | 1.4  | 42.5* | 56.0         |
| 13. Does a science teacher’s right to free speech entitle him or her to teach “evidence against evolution”? (LeVake v. independent School District #656, 625 N.W. 2d 502 [MN Ct. of Appeal 2000], cert. denied, 534 U.S. 1081 [2002]) | 10.2 | 62.6* | 27.2         |
| 14. Can science teachers be required by school administrators to read aloud a disclaimer saying that their teaching of evolution is not meant to dissuade students from accepting the biblical version of creation? (Freiler v. Tangipahoa Parish Board of Education, 185 F3d 337 [5th Cir. 1999], cert. denied, 530 U.S. 1251 [2000]) | 25.6 | 37.2* | 37.2         |
| 15. Can science teachers teach creationism if their school district adopts a course textbook that promotes creationism? (Hendren v. Campbell, Superior Court No. 5, Marion County, Indiana, 14 April 1977) | 22.7 | 38.2* | 39.1         |
| 16. Is evolution a religion? (Peloza v. Capistrano Unified School District, 37 F3d 517 [9th Cir. 1994]) | 1.9  | 96.1* | 1.9          |
| 17. Does teaching evolution promote the religion of evolution and therefore violate the establishment clause of the Constitution? (Peloza v. Capistrano Unified School District, 37 F3d 517 [9th Cir. 1994]) | 1.4  | 91.3* | 7.2          |
| 18. Did the Scopes trial strike down the laws that banned the teaching of human evolution? (Scopes v. The State of Tennessee, 289 S.W. 363 [Tenn. 1927]) | 20.4 | 35.9* | 43.7         |
| 19. At the Scopes trial, was Scopes convicted? (State of Tennessee v. John Thomas Scopes, Nos. 5231, 5232 [Tenn. 1925]) | 38.2*| 15.5  | 46.4         |
| 20. Is teaching intelligent design unconstitutional? (Kitzmiller v. Dover Area School District, 400 F. Supp. 2d 707 [M.D. Pa. 2005]) | 26.6*| 31.4  | 42.0         |
Table 2. Teaching level and understanding of evolution-related laws.

| Teaching Level          | Mean | Min. | Max. | SD  | n   |
|-------------------------|------|------|------|-----|-----|
| Elementary              | 9.18 | 0    | 16   | 4.35| 34  |
| Middle/junior high      | 11.59| 0    | 20   | 5.00| 34  |
| High/senior high        | 13.10| 2    | 20   | 4.24| 131 |

Table 3. Teaching experience and understanding of evolution-related laws.

| Teaching Experience | Mean | Min. | Max. | SD  | n   |
|---------------------|------|------|------|-----|-----|
| ≤2 years            | 8.89 | 2    | 14   | 3.66| 9   |
| 3–5 years           | 11.38| 2    | 20   | 3.87| 34  |
| 6–10 years          | 11.75| 0    | 20   | 5.56| 40  |
| 11–15 years         | 12.88| 4    | 20   | 3.80| 41  |
| 16–20 years         | 13.00| 2    | 20   | 4.70| 32  |
| 21–25 years         | 13.11| 2    | 20   | 4.70| 19  |
| 26–30 years         | 11.63| 6    | 17   | 3.86| 8   |
| ≥31 years           | 12.44| 3    | 20   | 4.61| 16  |

Table 4. Time devoted to teaching evolution and understanding of evolution-related laws.

| Time Devoted to Evolution | Mean | Min. | Max. | SD  | n   |
|---------------------------|------|------|------|-----|-----|
| None                      | 7.29 | 0    | 16   | 5.18| 17  |
| ≤1 hour                   | 10.71| 7    | 14   | 2.70| 7   |
| 2–4 hours                 | 9.67 | 4    | 15   | 3.34| 12  |
| 5–8 hours                 | 11.80| 5    | 17   | 3.65| 15  |
| 9–12 hours                | 11.19| 2    | 19   | 4.52| 27  |
| 13–16 hours               | 12.58| 3    | 20   | 3.63| 36  |
| ≥17 hours                 | 13.79| 2    | 20   | 4.61| 79  |

There were differences in mean total scores on the legal questions among the three teaching levels surveyed (Table 2). A Kruskal-Wallis H-test showed that there was a significant difference in scores between teachers at the different levels ($\chi^2 = 15.803, df = 2, P = 0.000$), with a mean rank score of 66.31 for elementary teachers, 95.51 for middle/junior high teachers, and 109.91 for high/senior high teachers. The mean number of correct responses was 9.18 among elementary teachers, 11.59 among middle school teachers, and 13.10 among high school teachers.

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Overall, the mean total scores on the legal questions do not indicate a monotonically increasing trend based on years of teaching experience (Table 3). A Kruskal-Wallis H-test showed that there was a nonsignificant difference in scores between the different levels of teaching experience ($\chi^2 = 10.183, df = 7, P = 0.178$), with a mean rank score of 58.22 for those with ≤2 years of experience, 86.32 for those with 3–5 years, 98.14 for those with 6–10 years, 108.76 for those with 11–15 years, 110.27 for those with 16–20 years, 115.03 for those with 21–25 years, 91.50 for those with 26–30 years, and 100.66 for those with ≥31 years. However, those with ≤2 years of teaching experience scored the lowest (mean = 8.89), and those with 3–5 years of teaching experience scored second-lowest (mean = 11.38).

There was a general trend of increased understanding of evolution-related laws with classroom time per class semester devoted to teaching evolution (Table 4). A Kruskal-Wallis H-test showed that there was a significant difference in scores between the different amounts of time devoted to teaching evolution ($\chi^2 = 27.922, df = 6, P = 0.000$), with a mean rank score of 49.29 for those not devoting any time to teaching evolution, 75.57 for those devoting ≤1 hour, 64.67 for those devoting 2–4 hours, 92.97 for those devoting 5–8 hours, 86.35 for those devoting 9–12 hours, 103.17 for those devoting 13–16 hours, and 115.67 for those devoting ≥17 hours. Those teachers who devote no time to teaching evolution had the lowest mean score on the legal questions (7.29), and those who devote ≥17 hours of instructional time to evolution had the highest mean score on the legal questions (13.79).
Discussion

To our knowledge, this survey is the largest and most wide-ranging attempt to determine the extent to which K–12 public school teachers in the United States understand evolution-related case law. In addition, we sought to determine how much time teachers devote to teaching evolution. We are encouraged to find that the majority (60.2%) of teachers surveyed allot ≥13 hours per class semester to the teaching of evolution, especially given that 17.1% of those surveyed teach at the elementary level, where time devoted to teaching science in general is low. In 2018, classes in grades K–3 spent an average of 18 minutes on science instruction each day, and classes in grades 3–6 spent only 27 minutes a day on science (Banilower et al., 2018). In recent years, the number of hours devoted to teaching evolution has increased, which has been attributed to the increased emphasis in state standards (Borgerding, 2012). Berkman et al. (2008) found that nationally, high school biology teachers devote 13.7 hours per class semester to teaching evolution. A study of Ohio biology teachers indicated that they spent an average of 11.6 hours per class semester teaching evolution (Borgerding, 2012). Friedrichsen et al. (2016) provide a detailed overview of the class time that secondary science teachers in Missouri dedicated to 13 evolution-related topics, among which the most time was spent on natural selection.

Within our sample of teachers, only 8.7% avoid teaching evolution or teach alternatives to evolution. While Berkman et al. (2008) reported that 25% of their national sample devoted at least one or two hours to creationism or intelligent design, they noted that those numbers can be misleading because teachers may do so in order to criticize evolution or respond to student inquiries. Most of the teachers we surveyed indicated that evolution is a unifying topic throughout the course (48.3%) or that they teach evolution as a unit like any other topic (31.8%). Only 9.0% do not cover evolution at all, and 10.9% use phrases like “change over time” instead of evolution. Friedrichsen et al. (2016) found that 60% of secondary science teachers in Missouri teach evolution as a theme in their biology classes, while Berkman et al. (2008) found that nationally only 23% of teachers do so. Just how many teachers completely avoid evolution is not well established in the literature. Rutledge and Mitchell (2002) reported that 23–45% of the 552 Indiana public high school biology teachers they surveyed reported that they avoid or only briefly mention evolution in their biology classrooms. Among Canadian elementary school preservice teachers, almost a third had reservations about teaching evolution or planned to avoid it entirely (Asghar et al., 2007). The results of our survey suggest that this population of K–12 teachers from across the United States devote ample time to evolution and approach evolution either as a unifying theme throughout the course or as a stand-alone chapter like other course topics.

The primary focus of this study was to determine K–12 teachers’ understanding of evolution-related laws. Taken as a whole, the responses indicate that a majority of the teachers surveyed possess a sufficient understanding of legal issues but lack sufficient understanding of the more nuanced aspects of evolution case law. When asked if it is still a crime to teach evolution anywhere in the United States today, 51.2% indicated they did not know and only 33.3% correctly responded that it is not. The survey results indicate that 54.6% of teachers did not know if the court determined that creation science has no scientific merit, while 34.3% responded correctly to the question. Only 26.6% of teachers correctly responded that teaching intelligent design is unconstitutional, while 42.0% stated they did not know.

The addition of the option “I don’t know” is informative in that it may mean just that. These teachers do not know enough about the topic to confidently respond to legal questions referring to past court cases. For several of the questions, a high percentage of teachers chose “I don’t know.” Rather than guessing the answer, the teachers may have felt more confident simply stating that they did not know the answer.

These results indicate that greater emphasis on the legal aspects of teaching evolution is needed, both in K–12 teacher preparation programs and in ongoing professional development or graduate-level science education courses for inservice teachers. Science teacher education programs should consider the legal imperative of evolution instruction and assist teachers in moving beyond their comfort zones (Hall & Woka, 2018). We have produced some resources (Hermann, 2013, 2017; Shane et al., 2016, 2020) that science teacher educators can use to help prepare K–12 public school teachers to teach evolution in a manner consistent with the law. These readings provide an overview of the legal challenges to the teaching of evolution in public schools. Additionally, a recent study suggests that engaging students with direct readings of court cases can result in a shift in preservice teachers’ views about teaching potentially unconstitutional alternatives (Vaughn & Robbins, 2017).

Vaughn and Robbins (2017) provide some strategies for teaching about evolution and the law that have implications for students’ attitudes and understanding about evolution. Though their work was done with preservice teachers, the activities can be implemented with little modification for public school students as well. They required their students to write a three- to five-page paper about the legal and philosophical basis of teaching evolution in public school classrooms. Students read Supreme Court decisions (Epperson v. Arkansas, 1968; McLean v. Arkansas Board of Education, 1982; Edwards v. Aguillard, 1987; Peloza v. Capistrano, 1994; Kitzmiller et al. v. Dover, 2005), along with readings from books, magazines, peer-reviewed papers, and other sources. The students also read statements from religious organizations endorsing evolution (see Sager, 2008) and from religious scientists discussing how they reconcile their beliefs with their work. Perhaps the most challenging activity to implement would be to provide guest lectures by teachers of theology and philosophy; in the study these lectures were designed to speak about the different benefits and purposes of myth and science, truth and fact. Vaughn and Robbins (2017) found that when the preservice teachers were required to read and write about Supreme Court cases, their opinions shifted significantly. Support for teaching intelligent design and creationism declined from 26% to 11.5%. The authors found that only when their students were given the writing assignment described above, along with readings and analysis of specific classroom challenges, did a large majority of them end up supporting the teaching of evolution.

Conclusions

Our results provide insight into the current understanding of evolution-related case law among this sample of K–12 public
school teachers from across the United States. The teachers surveyed generally maintain a sufficient understanding of legal cases surrounding the teaching of evolution, but there are some alarming instances of teachers not fully understanding information that should be more widely and deeply understood among science teachers. Knowing what legally can and cannot be done when teaching evolution can inform teachers’ practice and help them navigate conversations with students either individually or in groups. All K–12 teachers across the nation should know that they may not teach creation science, intelligent design, or other forms of creationism – neither alone, nor in the interest of equal time, nor under the guise of evidence against evolution. Moreover, school district administrators must know that they can prohibit a teacher from teaching alternatives to evolution, and that they can require a science teacher to teach evolution. While science educators may believe that these facts are widely known by those who teach science in the United States, the results of this survey suggest that additional preservice and inservice training is required to ensure that all K–12 public school teachers in the United States are aware of and compliant with evolution-related laws.

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