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Conservation education in schools: Aligning teachers' perceptions with students' attitudes

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ABSTRACT

As global environmental problems intensify, the importance of providing effective conservation education to young people is increasingly apparent. To accomplish this, teachers' perceptions and students' attitudes about conservation education in schools must align. This article explores students' attitudes via a survey distributed to students from one suburban high school in Kansas. Teachers across multiple schools in the same district responded to a similar survey. The survey results indicate that most teachers and students agree that a multifaceted approach that actively engages students across the curriculum, and throughout all grades, in learning about the environment and conservation would be most effective.

The rapidly escalating problems of climate change, air and water pollution, habitat destruction, and loss of biodiversity have researchers, educators, and leaders around the globe clamoring for solutions. The growing and immediate need to address global environmental concerns has created a world-wide push to actively educate young people about these critical issues (Pedretti & Nazir, 2014). Teaching conservation education in schools and through various environmental organizations can be instrumental in helping students develop a strong sense of environmental literacy (Monroe, 2003) and in preparing them to address current and future environmental issues (Kruse & Card, 2004).

In her address at the National Science Teachers Association Conference in 2010, Lynne Cherry, author of *Young Voices on Climate Change*, asserted that environmental education is essential to the future well-being of our planet and that educators play a crucial role in delivering this message to students. It is these students, she said, who will then "change society from the roots up" (2011, p. 210). Zsóka, Szerényi, Széchy, and Kocsis (2013, p. 137) agree, describing students as "key drivers of a more sustainable future." Consequently, they must be encouraged to develop the skills, knowledge, and attitudes to make responsible environmental choices (Monroe, 2003).

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Researchers increasingly acknowledge the need to engage students at all grade levels in learning about the environment, conservation, and sustainability practices (Blanchet-Cohen & Reilly, 2013; Hill et al., 2014; Pedretti & Nazir, 2014). The commonly cited goal of environmental education is to help students develop good critical thinking, decision making, and citizenship skills so they can reduce their environmental impact and adopt healthy, life-long conservation behaviors (Heimlich, 2010; Monroe, 2003). Specifically, children need opportunities to explore issues and engage in activities relevant to them (Short, 2010). These ideas are consistent with the goals and guiding principles of environmental education outlined in the Tbilisi Declaration of 1977, which provides the original framework for environmental education around the world.

Although students may not yet be in a position to affect change on the more serious environmental problems, teachers can provide students with opportunities to understand the complexities of environmental issues and help them develop favorable perceptions about the environment (Chawla & Cushing, 2007). Additionally, research indicates that repeated exposure to conservation education improves students' comprehension and attitudes about conservation issues. In their study of participants at a zoo summer camp, Kruse and Card (2004) determined that as the campers advanced through a four-step animal husbandry program, which allowed them more involvement at each level, their self-reported conservation-oriented knowledge and attitudes improved. The authors maintain that this repeated exposure is necessary to reinforce positive conservation behaviors. Although this research was conducted at a summer camp, the concept can easily be applied to schools as well.

Researchers may advocate the positive influence of environmental education for long term conservation efforts, but implementing effective conservation education programs in schools is not necessarily an easy task. The success of this process is likely dependent on students' receptiveness to the concepts addressed in conservation education as well as teachers' abilities and desires to incorporate conservation education into their lessons. Current educational practices do not always consider the broad range of attitudes students have about the environment and conservation; thus, educators must not mistakenly focus only on those students who are already committed to the environment. They must also find ways to reach those students who are less committed (Zsóka et al., 2013).

Exploring teachers' perceptions and students' attitudes

To reach all students effectively, teachers must have a realistic understanding of their students' attitudes about conservation education. This article discusses two consecutive studies that compare teachers' perceptions of conservation education with those of some of their students. The first study, conducted in 2014, investigated teachers' perceptions of conservation education in schools to determine *at which grade level educators think the teaching of conservation education would be most effective: elementary school, middle school, or high school?* In this survey, teachers at an

elementary school, a middle school, and a high school in the Shawnee Mission School District of Johnson County, Kansas, were asked their opinions about conservation education in schools and how receptive they perceived students to be to the subject. As part of this survey, teachers identified high school as the grade level at which students are least receptive to environmental education. This information prompted a 2015 survey of high school students that explored how the teachers' perceptions align with the students' attitudes. Specifically, this second study asked: *How do teachers' perceptions of high school students' receptiveness to conservation education compare to the students' actual receptiveness?*

The subject of environmental education in schools has been a controversial issue in the conservative state of Kansas. Twice since 1999, the Kansas State Board of Education (KSBE) has adopted science standards that challenged Darwin's theory of evolution and ignored climate change. In 2013, however, the KSBE adopted the Next Generation Science Standards after parents petitioned the board to allow their children "a 21st century science education" (NCSE 2013; Toppo, 2005). Despite this state-wide discord, the Shawnee Mission School district has historically been a progressive school system that serves an economically and culturally diverse cross section of Midwest suburban families (SMSD–Public Information, 2016).

Methods

Teacher survey

To inform this study, teachers at the elementary, middle, and high school levels completed an online survey about their perceptions of conservation education in their individual classrooms as well as their school. Approximately 40 teachers at Sunflower Elementary School, 65 teachers at Westridge Middle School, and 130 teachers at Shawnee Mission West High School were invited to take the survey. Seventy teachers responded. Sunflower Elementary students advance to Westridge Middle School and then attend Shawnee Mission West High School.

The survey asked respondents to designate the grade, building, and subject areas in which they teach environmental issues, and their preferred teaching methods. It also explored several facets of teachers' opinions including how receptive they think students are to lessons with an environmental message and how important they think it is to include conservation education in school curricula. The survey asked respondents to give examples of how conservation education is currently being incorporated into their school curriculum and to identify any conservation activities they would like to address in their classrooms in the future.

The survey, which included 16 multiple choice, three Likert-scale, and five open-ended questions, was available to teachers online for eight days. Survey results were tabulated using Google forms and the responses to the open-ended questions were categorized by their similarities. Representative examples were then used to illustrate the quantitative data.

Student survey

To inform this study, students at Shawnee Mission West High School in Johnson County, Kansas, completed an online survey exploring their thoughts about conservation education during their elementary, middle, and high school experiences. Parental consent was obtained through a passive consent process approved by the Internal Review Board of Miami University. Approximately 1,790 high school students were invited to take the survey and, of those, 350 students responded. The survey, which gathered both qualitative and quantitative data, asked respondents to designate their gender and grade level, and to identify when in their elementary, middle, and high school experiences they had encountered conservation education. It explored several facets of students' opinions, including how important they consider conservation education to be, whether they think conservation should be taught in schools, and what teaching methods they prefer the teachers use in presenting this information.

The survey consisted of nine multiple choice, four Likert-scale, and seven open-response questions. For the purpose of this survey, students were advised they could use the terms "conservation" and "environment" interchangeably. To maintain consistency with the teacher survey, results of the student survey were also tabulated using Google Forms and responses to the open-ended questions were categorized by their similarities and used to illustrate the quantitative data.

Results and discussion

Students from Shawnee Mission West High School were chosen to participate in this study because most of them have taken classes with many of the teachers previously surveyed. Consequently, it should be possible to obtain a reasonable comparison of perceptions between teachers and students.

Respondent demographics

Teachers

Seventy teachers completed the teacher survey. The overall response rate for this survey was approximately 30%, with 38 respondents from high school, 17 from middle school, 14 from elementary school, and one unspecified school. Of those teachers, 77% (55) were female and 23% (16) were male. Teachers in all age ranges (from 21–70 years) responded. All grades (K–12) were represented as were all subject areas in the middle and high schools.

Students

The overall response rate for the student survey was approximately 20%. Of the 350 students who completed the survey, 202 (57.7%) were female, 139 (39.7%) were male, and nine (2.6%) students chose not to identify their gender. All high school grade levels were represented with 116 (33.1%) freshmen, 84 (24.0%) sophomores, 83 (23.7%) juniors, and 67 (19.1%) seniors participating in the survey.

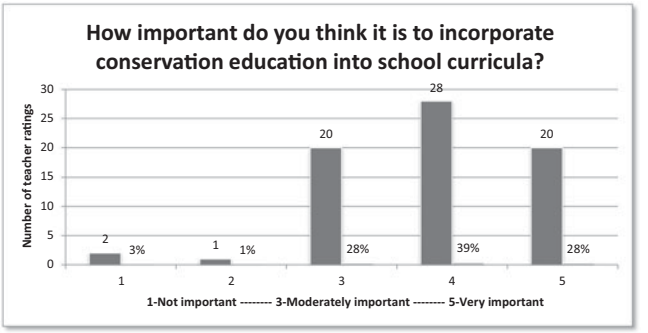

Figure 1. Using a Likert Scale rating of 1 (*Not important*) to 5 (*Very important*), teachers rated their opinions of how important it is to incorporate conservation education into school curricula. Ninety-five percent of respondents rated conservation education as 3, 4, or 5 (*moderately* to *very important*).

Importance of conservation education

Teachers

In a combined response from all three schools, 93% of teachers rated conservation education as moderately to very effective in shaping students' behaviors and attitudes toward the environment. Eighty-five percent said conservation education should be included in school curricula and 95% rated this inclusion as moderately to very important (see Fig. 1).

Students

In a combined response from all four grade levels, 84.7% of students either agreed or strongly agreed that it is important for their generation to learn about environmental issues. Student responses largely supported the teachers' opinions with 73% of students saying teachers should help students understand environmental problems (see Fig. 2). Twenty-seven percent of students were either neutral, disagreed, or strongly disagreed with this statement.

In open comments, students expressed a wide range of opinions about conservation education in schools. Many respondents expressed sentiments similar to the one given by an 11th grade male: " … Everyone needs to be informed and must help regardless of their personal opinion; this is where we live …." However, although the majority of students think learning about environmental issues is important, 15.4% of students remained neutral, disagreed, or strongly disagreed. One 9th grade female responded, "I don't even know what conservation means, nor do I care."

Student receptiveness

Teachers

More than a third of the teachers (35%) identified Grades 4–6 as the time when students are *most* receptive to conservation education. At this age "they are old enough to understand and young enough to be greatly influenced," one respondent

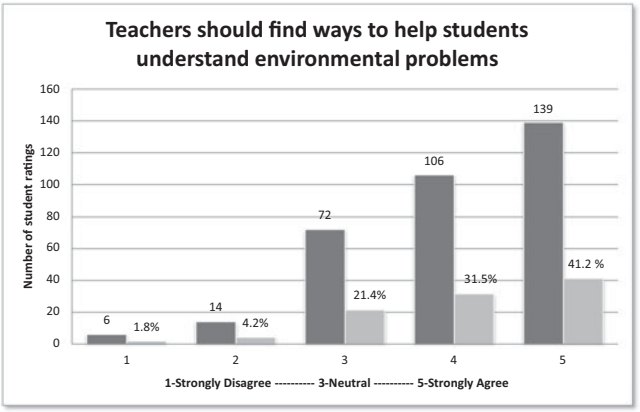

Figure 2. Using a Likert Scale rating of 1 (*Strongly disagree*) to 5 (*Strongly agree*), students rated their opinions of whether teachers should include conservation education in their curricula. Nearly 73% of respondents agreed or strongly agreed that teachers should help students understand environmental issues.

explained. Another wrote, "They are still fascinated with the world around them and they are starting to want to improve it and make changes." Twenty-five percent identified K–3rd grades; 18% identified 9th–12th grades; and 14% identified 7th and 8th grades as being most receptive to such lessons.

Conversely, 34% of teachers identified Grades 9–12 as the time when students are *least* receptive to conservation education reasoning that most high schoolers are either "set in their ways" or too "consumed with their own concerns." Twenty-eight percent identified 7th and 8th graders because they are "too self-absorbed"; 27% identified K–3rd graders saying they are simply "too young" to understand the concepts; and only 1% identified 4th–6th graders as being least receptive to conservation education (see Table 1).

Students

Despite teachers' perceptions that high schoolers are least receptive to conservation education, a majority of students surveyed actually identified high school as the grade level at which to teach conservation education. Students also indicated that conservation education should be taught at all grade levels to be effective (see Fig. 3). One 12th grade female explained:

Table 1. Teachers' perceptions about when students are most receptive and least receptive to learning about conservation and environmental issues.

	Most receptive		Least receptive	
Grades	# of responses	% of total responses	# of responses	% of total responses
K–3rd	18	25	19	27
4th–6th	25	35	1	1
7th–8th	10	14	20	28
9th–12th	13	18	24	34

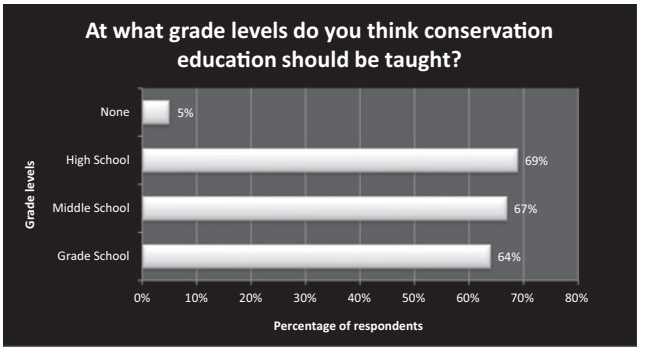

Figure 3. A majority of students identified high school as the optimal time to teach about environmental issues. However, to be effective, students think conservation education should be taught at all grade levels. They were allowed to select more than one option.

> … it is best to continuously teach conservation education from grade school to middle school to high school because it will stay with kids as they are growing up. By the time these kids are adults they will be consciously aware of protecting this planet.

A 9th grade female said, "I believe that conservation education should be taught at all levels because everyone has room to learn more about their environment and help it." These comments align with research asserting that students' conservation attitudes can be enhanced when they are taught conservation issues continually from an early age and into adulthood (Kruse & Card, 2004). Therefore, students should be given multiple opportunities to improve their environmental awareness which can empower them to make responsible environmental impacts in the future (Short, 2010).

A common thread in several student responses shows that they recognize the value of conservation education and think it should be taught in schools, but they do not want it dictated to them. An 11th grade female stated this directly, "It would be nice if the school offered education on conservation, but I think that people won't take it seriously if it is forced upon them." Similarly, a 9th grade male said:

> If you are to teach about conservation of the environment, it needs to be in an interesting way. Students at this age will not listen to boring lectures about it and won't care about it if that's what they get.

These conflicting attitudes may be, in part, why teachers identify high schoolers as being less receptive to learning about this topic. The result is that teachers are left with the task of finding innovative, interesting ways to reconcile this dilemma. One way to accomplish this is to steer clear of presenting students with a "litany of environmental wrongs" (Miller, 2005, p. 1). Such fear factors will not effectively motivate students to want to learn more about conservation. In fact, if environmental problems seem overwhelming, students may opt to avoid the topic altogether—a behavior Sobel (1996) calls "ecophobia." Instead, teachers should share environmental success stories to inspire students to learn more about conservation issues and take positive environmental action (Cherry, 2011).

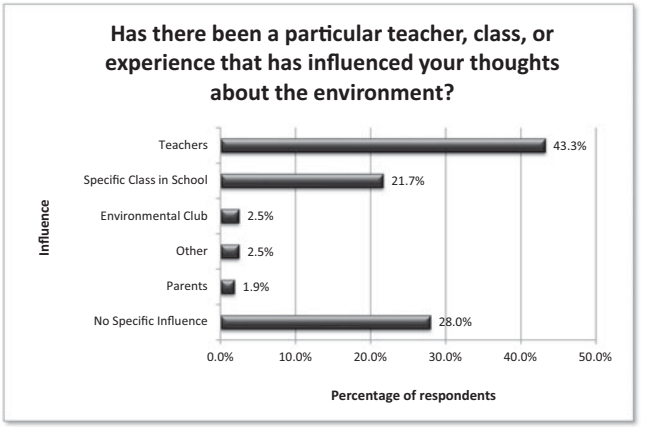

Figure 4. Sixty-five percent of survey respondents named either a teacher or a specific class in school as influencing their thoughts about the environment the most. Other influences included clubs, social media, and parents. Twenty-eight percent of respondents said no specific individual, class, or experience has influenced their attitudes about the environment.

Of the 157 students who responded to an inquiry about who (or what) has most influenced their environmental attitudes, 68 (43.3%) identified teachers, 34 (21.6%) referred to a specific class, four (2%) said the school's environmental club, and four (2%) students mentioned other influences: Boy Scouts, the zoo, social media, and books. Three (1.9%) students said their parents were most influential. The remaining 44 (28%) students responded that *no* specific individual, class, or experience has influenced their attitudes about the environment (see Fig. 4).

Classroom incorporation and methods

Teachers

Most teachers (66%) said they try to incorporate some type of conservation education in their classroom teaching, most commonly in science, social studies, and language arts (see Fig. 5). This was consistent at all three school levels. Teachers also identified all subject areas as having potential to incorporate conservation education. However, music, physical education, and world languages were perceived as being less conducive to teaching conservation education topics.

Teachers identified participatory learning, discussion, and inquiry as the methods they most often use when teaching conservation education with 70% of teachers describing participatory learning as a method they consider most effective. Only 8% of teachers considered lecture to be an effective method of engaging students in conservation education.

Students

Students said they learn about the environment and conservation primarily in science classes in high school (63.6%) and middle school (66%). Although students

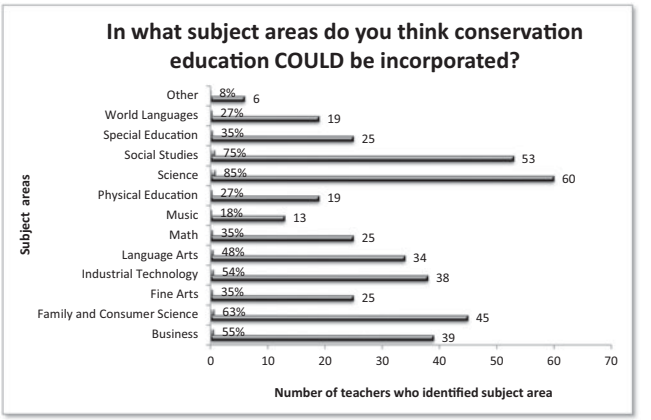

Figure 5. K–12 teachers think conservation education COULD be incorporated in all subject areas. They identified science and social studies as the most common areas to teach about environmental and conservation issues. Music, physical education, and world languages are the least conducive subject areas in which to teach conservation topics.

identified science followed by social studies as the subject areas in which teachers incorporated conservation lessons, they did not indicate that conservation was taught in language arts very often. They described increasing increments of exposure to conservation education throughout grade school, culminating with the most activity during 5th and 6th grades.

Notably, 20% of students did not think conservation education was taught anywhere in the curricula at any grade level. This disparity may be because of how individual students interpreted the survey question or how they chose to define conservation education. It is also possible that teachers embellished both the methods they use and how often they incorporate environmental education in their classrooms. Nonetheless, this represents a substantial population of students who are not being reached by teachers' efforts.

The fact that students overwhelmingly identified science classes as the place where they most often encounter conservation education suggests there is room in many other subject areas to explore conservation issues. Students who do not like or perform well in science will likely not be receptive to the conservation messages being presented to them in that arena. However, they may be more receptive when encountering conservation topics in classes they like. Consequently, teaching about the environment should not be simply relegated to science teachers, and all teachers should understand there are multiple ways of looking at environmental issues (Jenkins & Pell, 2006).

Student respondents collectively identified field trips (64.0%), participatory education (50.1%), guest speakers (48.1%), and discussions (43.7%) as the preferred methods of learning about conservation topics (see Fig. 6). Students agree with teachers that lecture (10.3%) and assigned reading (5.9%) would be the least desirable methods. Davis and Cooke (2007) support these findings, explaining that interactive methods—such as participatory education—are better strategies to use when

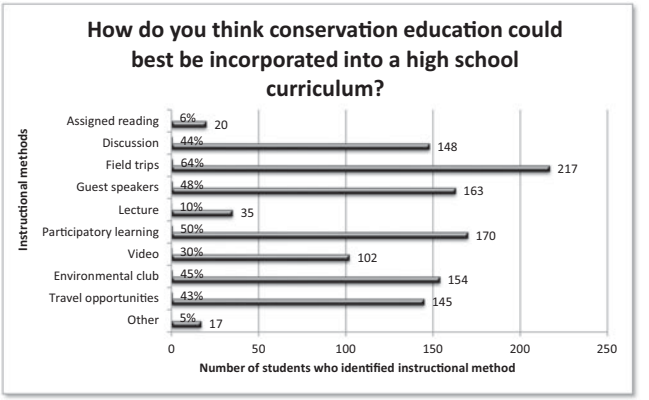

Figure 6. Students identified field trips, participatory learning, and guest speakers as the instructional methods they think would be most effective in helping them learn about conservation. Lecture and assigned reading are their least desirable methods to learn about environmental issues.

engaging learners in exploring environmental problems because of the complexities of many environmental issues. Students also expressed notable interest in an extracurricular environmental club (45.4%) and extracurricular travel opportunities (42.8%).

Conclusions and recommendations

Both surveys gleaned substantial information regarding students' and teachers' thoughts about conservation education, but there are still many underlying factors to consider. Future studies could explore how different demographics relate to student/teacher responses: What role can socioeconomic status, ethnicity, political views, academic standing, gender, or grade level play in students' and teachers' attitudes and receptiveness to conservation education? Also, because the geographic range of this research is small, reproducing this study in other geographic areas would help determine if these findings can be generalized to a broader audience.

When considering these questions, it is compelling to remember that 64% of students identified either teachers or classes as the most influential factors in shaping their attitudes and opinions about the environment or conservation. In fact, according to the student survey, teachers are more influential than parents in helping students develop these opinions. This puts teachers in a prime position to facilitate students' environmental literacy and empower them to make positive environmental choices.

Results of the student survey reveal that high school students *do* think learning about the environment is important to them and conservation should be taught in schools. They think it should be taught at all grade levels, particularly high school, using a variety of interactive, participatory methods that will provide real-life, meaningful correlations for them. On these points, teachers' perceptions of student receptiveness and students' actual attitudes about conservation education align closely.

From this study alone, it is difficult to ascertain whether teachers are correct in their assessment that high school students are the least receptive of all grade levels. Approximately one fifth of this school's surveyed population does not think conservation education is addressed in schools and 15% of students express apathy. This suggests that the teachers' assessment may have some merit. Therefore, if schools are committed to teaching conservation education, teachers need to find different avenues of engaging these apathetic or reluctant students. Ultimately, teachers should be reassured that the majority of students realize this information is important and are, indeed, receptive to learning about it.

Responses given by students and teachers alike support the premise that teachers should incorporate age-appropriate environmental lessons throughout the curricula beginning in Kindergarten and continuing through high school. Therefore, school districts should work to encourage and facilitate teachers in their efforts to incorporate meaningful environmental education lessons into their classrooms.

This research study indicates a three-pronged approach to a comprehensive conservation education plan would be effective at the high school level. This approach should include cross-curricular instructional variety, challenging opportunities, and all-inclusive, school-wide initiatives. First, because students do not want to feel "forced" to learn about the environment, all teachers should look for less obvious, but still effective opportunities to incorporate smaller conservation topics into their lessons. If this is done across the curricula, it may catch the interest of some of those hard-to-reach students. Second, students who are actively interested in conservation should be offered creative, participatory opportunities to explore this subject more in-depth and share their knowledge with their community. This may be done through extracurricular opportunities or a specialized class. Third, existing school-wide conservation initiatives should be evaluated and enhanced. Everyone in the school community should be informed of these initiatives and actively encouraged to participate. Ultimately, with a combination of innovation and collaboration, this cohesive approach to conservation education could be very successful.

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