JSSER
www.jsser.org

Journal of Social Studies Education Research

Sosyal Bilgiler Eğitimi Araştırmaları Dergisi

2022:13 (1), 1-34

Social Studies, Civics, and Fracking: Ohio Teacher Perceptions of Controversial Environmental Issues

Matthew S. Hollstein[1]

Abstract

Hydraulic fracturing or fracking as it commonly referred, has seen tremendous growth in Ohio over the last 10 years. However, this growth comes at a price which makes fracking a current event which is also a controversial environmental issue. Recent work by young activist like Greta Thunberg and others have highlighted a sincere interest from social studies students in issues related to the environment. Fracking is an ideal issue for study in an American Government classroom. The purpose of this study was to determine the status of teaching about fracking in Ohio American Government classrooms, as well as any self-identified barriers that may have prevented them from teaching about the issue. This study was a mixed methods study which utilized surveys and content analysis to be able to draw conclusions. This study presents the findings of 62 Ohio American Government teachers and their positions on fracking and whether fracking is appropriate for a social studies classroom. The results showed that participants geographic location appeared to play a role in their positionality on the issue of fracking. Specifically, whether teachers were teaching about fracking and any self-identified barriers. This study highlights the multiple layers that exists in classrooms where issues like fracking may be addressed. The intersectionality of participants and their personal autonomy were important to understanding the results and suggestions for future research in this area and related areas of study.

Keywords: *Civics, Fracking, Social Studies, Controversy, Environmental Education*

Introduction

The shale oil and gas boom in the United States has led to the United States potentially surpassing Saudi Arabia as the world's largest oil and gas exporter (DiChristopher, 2019). There are many, including presidents Obama and Trump, who have heralded this as new era in American energy independence and have gone so far as to label it a matter of national security (DiChristopher, 2019; Slack, 2013). The primary means of accessing previously inaccessible oil gas deposits has been horizontal hydraulic fracturing or fracking (Zuckerman, 2013). Ohio is at the center of this boom as fracking operations have grown tremendously in the last 15 years (Ohio Department of Natural Resources, 2013; 2019). Fracking presents a nested issue that involves environmental, political,

[1] *Assoc. Prof., Social Studies Education, School of Teaching, Learning, and Curriculum Studies, Kent State University, mhollste@kent.edu*

historical, civic, and social implications and should be covered in Ohio American Government classroom. Fracking is an example of controversial environmental issues citizens should be aware, informed, and have knowledge to make informed action.

The correlation between Ohio and natural resources stretches far back into the state's past. Historically, Ohio has been exposed to natural resource extraction by both internal and external players who have harvested the state's resources, such as coal and timber, for financial gain at the economic and environmental expense of the region (Eller, 2008). Fracking constitutes a contemporary version of this legacy. It is a controversial, contemporary issue that has polarized the state and the nation. Significant tensions exist between those who argue that fracking is an unprecedented economic windfall and national security issue while others view it as an environmental disaster with long-term consequences that will leave the state devastated, both economically and environmentally (Dolesh, 2011; Hatzenbuhler & Centner, 2012; Obama, 2012; Ohio Department of Natural Resources, 2014).

Social studies teachers are tasked with guiding students through their development as citizens. This process entails understanding the nature and nuance associated with good citizenship. Specifically, social studies teachers must help students unpack the why and how good citizens should act, engage, and participate in our complex democracy. Fundamental in this process are issues and events which social studies teachers determine to be essential to enacting good citizenship. Environmental issues are a set of issues which often do not find their way into the social studies classroom. Furthermore, controversial environmental issues are often relegated to cursory overviews or all together not discussed in social studies. Fracking is one example of a controversial environmental issue which is complex and layered but whose understanding is necessary in social studies. In some cases, controversial environmental issues like fracking are discussed as economic issues. However, in this study the author argues that controversial environmental issues are essential to the social studies classroom because concern and stewardship for the environment are essential components of good citizenship. Therefore, the rational for this study comes from the author's 15 plus years of classroom teaching where few other teachers were discussing environmental issues in social studies classrooms.

Civic Environmentalism

Civics education aims to foster the development of knowledgeable, engaged, and active citizens who will view their roles, beliefs, and actions as being essential to their democracy (Chinn & Barber, 2010; NCSS, 2010). For this study civics education serves as the primary term while citizenship education is considered as nested within civics education. Today's Common Core curriculum and the National Council for the Social Studies' C3 framework represent the most existing articulation of civics education and the movement towards broadening the notion of citizenship (NCSS, 2013). Consequently, "good" citizenship now also must include an awareness of and social action towards environmental issues. E.O. Wilson (2006) argues that it is impossible to separate the individual and the environment while Bill McKibben (2011) has suggested that the price of inaction concerning environmental issues amounts to a global disaster. Presently, young activists like Greta Thunberg and her contemporaries have showcased this position in real time.

Controversial Issues in Social Studies

The use of controversial issues has proven to be a fruitful and worthwhile endeavor for both social studies teachers and students, as it allows for the critical examination of contemporary issues through the lens of the various social studies disciplines (Hess, 2004; Misco & Patterson, 2007). The process of examining controversial issues in the social studies begins with the teacher (Camicia, 2008). In order to fully understand the process, I will present a model that integrates both Diana Hess' (2005) and Thomas Kelly's (1986) model in order to offer a structure that seeks to yield a deeper understanding of controversial environmental issues in the social studies classroom as shown in Table 1.

This model emerged from my experiences teaching controversial issues. Specifically, as a new teacher I modeled Hess' balanced approach to teaching about controversial issues and purposefully did not share my opinions with students. However, I soon realized that I was underestimating my students' intelligence and intuitiveness and that through their questions and observations could clearly see that I had an opinion on the issue. Furthermore, students realized that I had an opinion on an issue merely by deciding to teach about it (Hollstein & Smith, 2020). I soon realized it was necessary to put trust in my students' academic ability to wrestle and unpack complex controversial issues while sharing my own to treat them as academic equals in the classroom. I often said it was "our classroom" but was not reflecting this in my actions. I was aware of Kelly's

(1986) model and often utilized Hess' (2005) model. I found that by combining these two models I was able to create a framework for addressing controversial issues in the social studies classroom which were more in line with how and why I taught controversial issues. I realized that by concealing my opinions was not helping prepare my students for times after they leave my class and engage in issues outside of the classroom.

Table 1

Model for Assessing Controversial Issues in Social Studies

Approach	Description
Denial	It is not a controversial political issue
Privilege	Teach toward a particular perspective on the controversial political issue
Avoidance	Avoid the controversial political issue
Balance	Teach the matter as genuine controversial political issue without favoring a particular perspective
Balanced Privilege	Teacher interjects their beliefs and an explanation of their thinking on the issue

Note: Adapted from "How Do Teachers' Political Views Influence Teaching About Controversial Issues?" by D. Hess, 2005, *Social Education, 69*(1), p. 47-48. Kelly, T.E. (1986). "Discussing Controversial Issues: Four Perspectives on the Teacher's Role." *Theory and Research in Social Education, 14*(2), 113.

Controversial Environmental Issues in Social Studies

In recent decades the environmental movement has started to have a deeper impact on local, regional, and global communities, and one need only look to the impact of teen activist Greta Thunberg (Alter et al., 2019; Tzou & Bell, 2012). Presently, not only in the United States but around the world, issues of sustainable energy use, development, and freshwater are just a few of the many issues that face humanity (Bromley et al., 2011). It is of paramount importance that students be aware of relevant and pressing contemporary and controversial environmental issues (Evans, 2004; Hess, 2005). Traditionally, environmental issues have been in the domain of the sciences (Ogunyemi & Ifegbesan, 2011). However, it is important to recognize that the scientific and social components of environmental issues are inseparable (McKibben; 2011; Wilson, 2006). Often, environmental issues are deemed controversial because numerous parties have invested and potentially opposite interests in their outcome. Only recently has the social studies begun to

address issues of sustainability (NCSS, 2013). However, to effect lasting curricular change, social studies teachers and teacher educators must adopt the position that civics education includes environmental awareness and responsibility as a requirement of good citizenship (Kumler, 2011; NCSS, 2013).

Significance

This research contributes new knowledge about civics education, current events, and controversial environmental issues in the social studies (Hess, 2002; Kumler, 2011). Although there is much scholarship on controversy in the social studies classroom, little is known about the use of controversial environmental issues (Camicia, 2008; Hahn, 1991; 1996; Hess, 2002; 2005; 2008; 2009; Journell, 2011; Kelly, 1986; King, 2009; Misco & Patterson, 2007). This study sought to add to the emerging scholarship on controversial environmental issues in the social studies classroom.

As both Hess' and Kelly's models contain gaps that do not fully address teachers' beliefs, actions, and experiences. This study introduces a new five-dimensional model for examining controversial issues based upon the work of Hess and Kelly. The first four dimensions will be based on Hess' model; the fifth dimension will be based in part on Kelly's (1986) fourth dimension of committed impartiality. The five dimensions of this new model are: denial, privilege, avoidance, balance, and balanced privilege. This model allowed for a more comprehensive interpretation and allowed the researcher to assess teachers' views on approaching controversial issues in the classroom.

Limitations

This study was limited by exclusively using surveys. While it was necessary to use online surveys, they do present a limited snapshot of participants' views. It would have been very beneficial to conduct onsite visits but was not practical to accomplish 62 sites visits, at a time when all participants were teaching relevant topics.

Purpose

The purpose of this research is to assess the status of teaching about fracking in Ohio American Government classrooms, and to determine what barriers existed that may prevent the teaching of environmental issues such as fracking. The decision to focus on the status of teaching about

fracking was made because what is taught in a social studies classroom may be reflective of what social studies teachers believe to be important and because the controversial nature of fracking has a direct impact on how issues are taught in the classroom (Hess, 2002; 2005; Hollstein & Smith, 2020; Kelly, 1986; King, 2009; Misco & Patterson, 2007). When social studies teachers fail to address controversial issues, such as fracking and its underlying causes, students may continue to frame such issues as non-controversial and marginalize their relevance. In this study, controversy serves as a term defined by the respective participants. This research is based on the notion of civic environmentalism, i.e. good citizenship includes an awareness of the social implications of environmental issues.

Research questions

This study seeks to answer the following research questions:

1. What is the status of teaching about fracking in Ohio American Government classes?
2. What barriers exist that may prevent teaching about fracking in Ohio American Government classes?

Review of literature

Fracking in the United States in a controversial environmental issue that is dichotomous in nature. On one side, you have an issue at the center of an American energy renaissance. Conversely, on the other side, exist an issue which has a high-risk factor for any potential reward due to its potential for major environmental fallout. Furthermore, the reward has typically gone to a wealthy few while the fallouts have been placed upon communities with little ability to respond. Fracking is a complex issue which cuts across lines of social studies, science, and environmental education. But fracking represents an ideal issue for study in civics, current events, and controversial issues instruction.

Theoretical Framework

This study was an exploratory study utilizing exclusively surveys given the size and scope of the participant pool, but which used an emergent design framework. This framework was selected given the limited nature that online surveys present and the limited ability of the researcher to physically observe 62 teachers from across Ohio (Creswell, 2017). An emergent design was most

appropriate because, while the researcher had questions and a focus in mind, it was not clear what might emerge from the data collection. This framework lends itself to follow-up studies in which the researcher can complete further check-ins with the participants to determine change over time.

Hydraulic Fracturing

Horizontal hydraulic fracturing or fracking, as it is commonly called, is a process energy companies use to access and harvest previously un-accessible natural gas deposits found in shale formations (Gjelton, 2012). In this process, engineers drill down vertically and then horizontally to access deposits and then employ chemical combinations of fracking fluids and water that are pumped into shale formations at extremely high pressures causing the shale rock to physically crack and release the trapped natural gas (Belcher & Resnikoff, 2013; Gjelton, 2012). Some wells can use up to 2-4 million gallons of fresh water to frack a well one time; the average well can be fracked up to 15 times in its lifespan (EcoWatch, 2012). After a well is fracked, the extracted natural gas returns to the surface with fracking wastewater, commonly referred to as brine. Companies often depose of the brine by storing it in clay-lined ponds, known as wastewater ponds. In Ohio, it is often pumped back into the ground into abandoned wells commonly called wastewater injection wells (Belcher & Resnikoff, 2013; Gjelton, 2012).

Ohio sits on top of two large shale formations as shown in Figure 1 (US Energy Information Administration [EIA], 2011). Presently the fracking process in Ohio has aroused much controversy. As of 2014, the Ohio Department of Natural Resources (2014) had approved permits for 1,123 fracking wells, and 750 of those wells were actively producing compared to 2019 approved permits for 3267 wells with 2761 producing and most of which can be found in the eastern half of Ohio (ODNR, 2019). This shows that regardless of the impact of fracking, there has been a rapid uptick in production. An added layer of controversy stems from Presidents Obama andTrump framing fracked natural gas as vital to American energy security (DiChristopher, 2019; Slack, 2013)

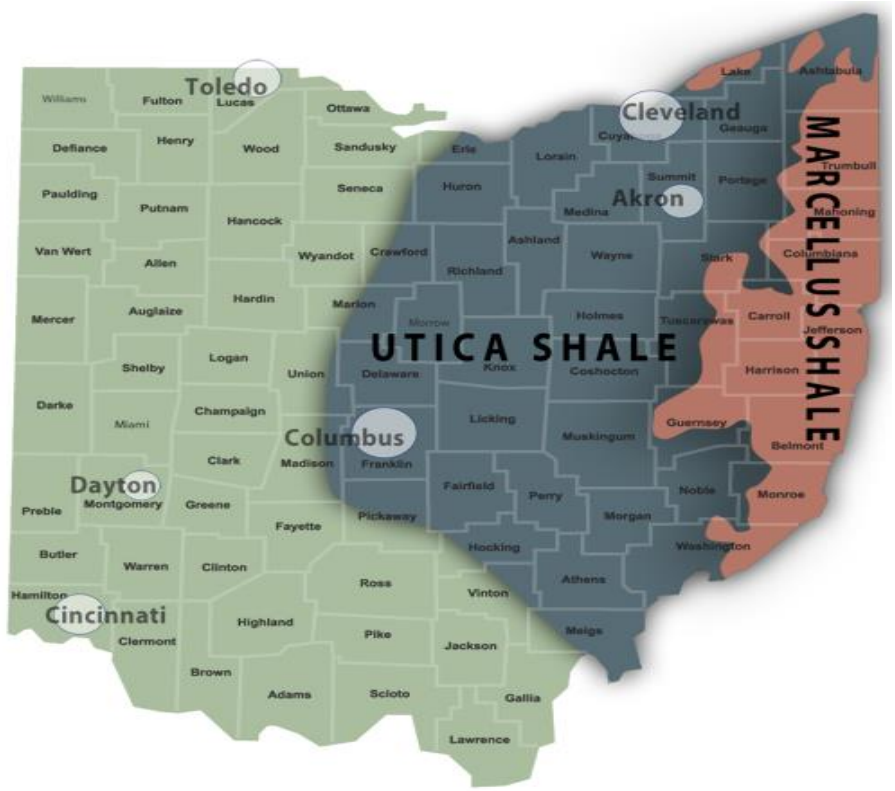

Figure 1. *Marcellus and Utica Shale Formations in Ohio*
Source: Ohio Department of Natural Resources (2014).

Central to the fracking debate are questions of economics, environmental degradation, and the equitable distribution of risk versus reward. The Appalachian region has seen decades of mineral extraction at the expense of local communities and has allowed outside groups to gain economic windfall while taking few of the environmental risks, leaving local populations with all the environmental risks and none of the economic rewards (Eller, 2012). Much of the anti-fracking movement is grassroots while the pro-fracking movement is dominated by the industry, itself (Helman, 2013).

Civics Education

Fostering good citizenship and civics education has been an essential role of the social studies throughout its history (American Historical Association, 1899; Anderson et al., 1997; Beard, 1929; Evans, 2004; Hess, 2002; 2005). Beginning with the American Historical Association (1899) report from the Committee of Seven to the National Council for the Social Studies (NCSS) (2014)

College, Career, and Civic Life Framework, it is clear that civics education has shaped both the field of social studies and the academic choices made by teachers. NCSS believes in engaged and informed citizens who engage in a successful civic life (NCSS, 2010; 2013; Risinger, 2009). While civics has always been a component of the social studies curriculum, there has not always been agreement on what civics education might look like and its actual purpose (Risinger, 2009).

The goal of civics education is to develop engaged, participatory, and active citizens capable of identifying problems in the civic space, followed by appropriate action (Levinson & Brantmeier, 2006; NCSS, 2013; Risinger, 2009). Like civics education, environmental education aims to develop informed citizens who care about their environment and possess the skills and knowledge necessary to effect change (Hollstein & Smith, 2020; NAAEE, 2019; Palmer, 1999). While the history of environmental education in the United States is of shorter duration than that of the social studies, both offer histories intended to develop similar citizens. The literature suggests a confluence of both goals and intended outcomes. Both include curricular models that require active engagement of real-world problems (Ceasar, 2012). Little is known about teachers' perspectives on the intersection of civics and environmental education and more research is needed to fill this gap.

Controversial Issues

Throughout the history of social studies education, controversial public issues (CPI) have been a part of the curriculum (Hess, 2002; 2005). As a discipline, the social studies takes responsibility for addressing controversial issues, both directly and indirectly, in order to develop informed and participatory citizens (Evans, 2004; Hess, 2002; 2005; King; 2009). Going back further, the American History Association's (1899) *Committee of Seven Report* suggested that history, as a precursor to the modern social studies, should be used to examine the social life. As the social studies evolved and was formally founded in the early 20th century, the inclusion of controversy persisted (NCSS, 1921). For much of the history of the social studies, the connection between controversial issues and effective citizenship has been the importance of being able to navigate and discuss controversial issues as a component of civics education (Newman, 1989). In today's highly connected world, it is important that students possess the skills necessary for understanding, discussing, and acting upon these issues (Hahn, 1991; Hess, 2002; 2005; 2008; Jorgensen, 2013; King, 2009; Patterson et al., 2012). Until recently, controversy in the social studies has mostly

been centered on curriculum choices rather than on teachers' dispositions (Hess, 2002; Washington & Humphries, 2011). Hess (2002) notes the importance of face-to-face discourse in the examination of controversy; this allows students to be able to easily understand the nature of controversy, while allowing teachers to facilitate the discourse taking place.

Current Events

The use of current events in the social studies classroom has been widespread since its beginnings (Deveci, 2007). Much of the literature shows that social studies teachers are in favor of and do use current events (Pass, 2007). However, Lipscomb and Doppen (2013) note that how current events instruction takes place and what this looks like is not clear. In addition, some social studies teachers may over-estimate how much they cover current events (Lipscomb & Doppen, 2013). While there are few stand-alone current events courses, current events instruction is typically embedded in existing social studies courses. NCSS' C3 framework (2013) provides a clear framework for incorporating current events on a consistent basis. Current events foster civic literacy, civic awareness, critical literacy, historical literacy, critical thinking, empathy, and personal understanding of internal conflicts regarding controversial issues (Journell, 2013; Libresco, 2003; Luckhardt, 2014; Pass, 2007; Pescatore, 2007; Sharp, 2009).

What has changed the social studies and the use of current events in the classroom is the development of new technologies and processes which enhance access to materials and information, in addition to potential filters that might skew information (Levinson, 2012). As current events and our level of access to them has changed, the duty of social studies teachers to be the informed among colleagues and serve as models of critically informed citizens is even more important (Libresco, 2003). Additionally, Camicia and Dobson (2009) suggest that having critical and informed citizens allows for issues of social justice to be better addressed. The study of current events in the social studies also allows students to find relevance in social studies subjects (Luckhardt, 2014).

Teaching current events helps students better develop the necessary skills to become successful members of a community and the greater civic collective (Camicia & Dobson, 2010; Haas & Laughlin, 2000; Journell, 2013; King, 2009; Libresco, 2003; McCoy, 2008; Pass, 2007). Teachers might find it easier to employ higher order thinking skills with current events instruction given the often-complex nature of the events (Camicia & Dobson, 2010). Controversial current events

require certain civic skills to understand and navigate the world in which we live (Hess, 2002; 2005; 2008; King, 2009; Sharp, 2009). Much of the literature suggests that the study of current events is an essential component of social studies education (Journell, 2013; NCSS, 2010; Sharp, 2009).

Place-based Education

Place-based education (PBE) has long been a part of social studies education (Beard, 1929). Dewey's (1923) *Democracy in Education* is a piece that many suggest as central to the focus of PBE. Central to this idea is the connection students make when connecting and examining the area they live in and which surrounds them. PBE is central to the study of controversial environmental issues like fracking and this study because the issue and events occurred and are occurring in the backyards of participants. Furthermore, PBE ask students and teachers to examine how issues we study in the classroom directly impact the places we call home (Resor, 2010). Resor (2010) notes that it is imperative that when utilizing PBE in the classroom that teachers must be thoughtful and purposeful in their decisions to disconnect the topic from the place and allow students to see both simultaneously.

PBE is well-suited to the study of fracking in the social studies because it has used frequently in the sciences and when studying environmental issues (Seneschal, 2007). Fundamental to the use of PBE is the understanding that the definition of place is subjective to the student (Creswell, 2004). It is important for teaches to help students unpack these ideas to help them better examine the consequences of issues like fracking and there it occurs.

Methodology

Design

The purpose of this study was to assess the status of teaching about fracking and any barriers to it being taught. Further, the researcher wanted to determine how the geographic positionality of participants played a role in influencing their responses. The variables the included participants knowledge of fracking, their comfort level with it, their geographic location, and any potential personal connections they may have had to fracking or related fields, either directly or indirectly. This study was mixed method and used a survey as a means of data collection (see Appendix A). Descriptive statistics of participant responses as well as participant written responses to the survey

administered via Qualtrics were compiled and analyzed in the findings section (Creswell & Creswell, 2017). The general population for this study constituted 9th through 12th grade social studies teachers of American Government with an n=62. Initially, invitations were sent to 150 American Government teachers which gave a response rate of 41%. The rationale for targeting these teachers was two-fold. First, American Government is intended to teach students the necessary skills for good citizenship, and second, this class serves as a transition from student to full citizenship. The theme of American Government and topics covered make it an ideal course for analyzing the status of teaching about an issue such as fracking.

Participants

The participants in this study were a collection of 62 different American Government teachers from across Ohio. This group was equally geographically distributed to create an equitable set of data from multiple participants. The teachers had varying levels of experience in the classroom but were mostly non-Hispanic White males with an average of 11 years of classroom teaching experience.

Instrument

The instrument used was an anonymous Qualtrics online survey which allowed for easy dissemination and retrieval. This survey included both quantitative and qualitative questions to elicit responses which allowed for a robust set of data. The Qualtrics survey proved to be the most effective means to collect the data given the even geographic distribution of participants across the state. The survey employed Likert scale-based questions as well as questions which allowed participants to complete extended responses to various questions. The survey gave participants the opportunity to express deeper thoughts and beliefs regarding certain parts of the study. Further, using a mixed set of questions create an opportunity quantify responses using descriptive statistics while also allowing for thematic content analysis.

Data Collection

Random sampling was used with the random number generator in Microsoft Excel. Purposeful sampling was used to select a population of American Government teachers across Ohio (Patton, 2002). The Ohio Department of Education's (ODE) typology of school districts was used as a

framework as shown in Table 2. To streamline the typologies, numbers one through four were combined into a new typology labeled rural/small town, numbers four and five were combined and labeled suburban, and numbers seven and eight were combined an labeled urban. This decision allowed for a more streamlined review of data and equal distribution of participants across the newly labeled typologies. The new typological classification focused on the distinctions of urban, suburban, and rural due to the disproportionate number of fracking operations being situated in rural and small-town communities versus suburban and urban communities which have very little as shown in Table 3 (ODNR, 2019). Random sampling was used until the required number of 50 teacher participants for each of the three typologies had been reached (n=62). Non-representative sampling was used to ensure that all three typology classifications in the state of Ohio were represented, due to the distribution of typologies not being representative of the population concentration within the state. Surveys were administered using Qualtrics data collection software. After completing data collection through a statewide survey, the data were analyzed for common themes.

Table 2

Ohio Department of Education Typologies

Typology	Classification
1	Rural - High Student Poverty & Small Student Population
2	Rural - Average Student Poverty & Very Small Student Population
3	Small Town - Low Student Poverty & Small Student Population
4	Small Town - High Student Poverty & Average Student Population Size
5	Suburban - Low Student Poverty & Average Student Population Size
6	Suburban - Very Low Student Poverty & Large Student Population
7	Urban - High Student Poverty & Average Student Population
8	Urban - Very High Student Poverty & Very Large Student Population

Source: Ohio Department of Education (2020)

Data

The data in this study was collected purely from the Qualtrics survey. However, the data itself was both quantitative and qualitative in nature. The data was a collection of Likert scale questions which allowed for the use of descriptive statistics. In addition, the extended responses were helpful and offered deeper insights in spaces where participants could offer their own descriptions of ideas and responses to questions related to the issue of fracking.

Data Analysis

The data were analyzed using thematic analysis the following three themes: participant background information, the status of teaching about fracking, and perceived barriers to teaching about fracking. Further, descriptive statistics were used to help determine slight interpretations of the data from a quantitative perspective. Questions which allowed for extended responses were analyzed for coming themes and the researcher noted the various themes which emerged from the data. Overall, this proved to be the most effective way to analyze the data to create meaningful interpretations of the data that appeared.

Delimitations

This study was delimited to teachers of American Government, a course typically taught during the junior or senior year of high school. Data collection was limited to a statewide online survey due to the size and scope of the population studied, specifically the decision to examine the entire state of Ohio, as well as the limited time and resources that were available to the researcher. The total number of participants was n=62 and was evenly distributed across typology as shown in Table 3.

Table 3

Participants by Typology

Typology	**Rural**	**Suburban**	**Urban**
Number of Respondents	21	20	21

Results

The results of this study will be separated into three thematic sections derived from the research questions: participant background information, that status of teaching about fracking in participant classrooms, and perceived barriers to teaching about fracking in participant classrooms. This structure answers the two primary research questions which were:

1. What is the status of teaching about fracking in Ohio American Government classes?
2. What barriers exist that may prevent teaching about fracking in Ohio American Government classes?

The data revealed the answers to the two research questions were far more nuanced and offered a sometimes-contradictory picture while simultaneously showcasing clear trends in what the participating high school American Government teachers were doing. Specifically, a few of the participants were teaching about fracking while a majority were not due to a few perceived internal and external factors. The data shows this perceived lack of autonomy for some participants and their ability to be gatekeepers (Thorton, 1989). Broadly, responses from participants who were not teaching about fracking cited a perceived lack of agency with the decision.

Participant background information

The Ohio American Government teachers in this study held different personal and professional beliefs about fracking, citizenship, and controversial issues. The perspectives of these teachers were influenced by several factors including demographics, years of teaching experience and typology. In general, the teachers in this study were mostly non-Hispanic White males; three fourths of teachers reported having at least 11 years of teaching experience, and males outnumbered females two to one. These demographics were significant regarding the status and barriers because each plays a significant role in shaping the identify and decision making of each teacher. Further, this suggests that while participants may have had some belief differences, they were part of a homogenous population with significant experience. It is important to recognize the impact that one's background has on how they view the world. For the participants in this study, where they live, how long they have been teaching and other identifying factors may have played a role in shaping their beliefs towards fracking. Geographic location was significant due to fracking

being a place-based issue that can only occur in certain parts of the state as shown in Figure 2. Specifically, those in regions where fracking was actively occurring may have been more aware but taught about it less.

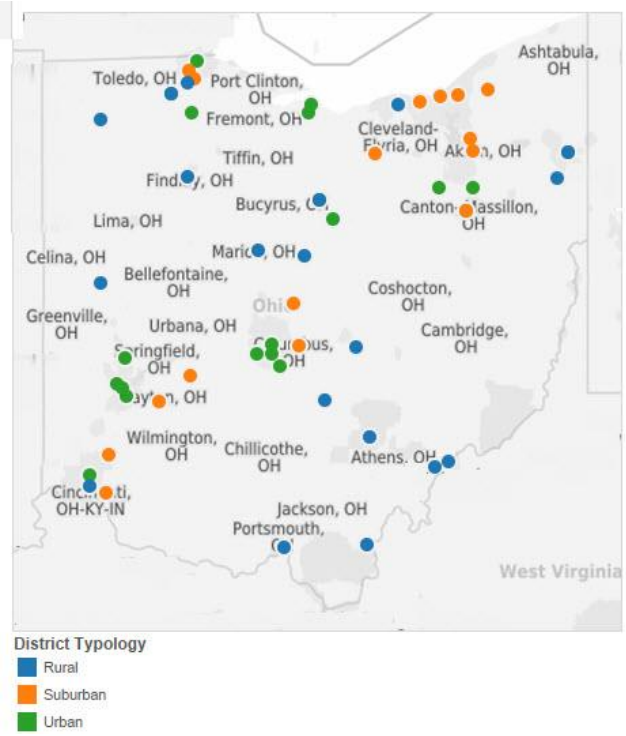

Figure 2*. Geographic Distribution of Participants*

Initially, participants were asked about the following definition of fracking: "Hydraulic fracturing (fracking) is a technique used by energy companies in which they drill vertically and then horizontally into shale formations in order to crack the shale formation with high pressure fluids to release natural gas and oil". They were then asked to rate their level of concern about fracking. The results clearly show that in urban areas where fracking was not happening as shown in Table 4, teachers were more concerned than in regions where it was occurring as shown in Table 5.

Table 4

Teacher Reported Fracking Operations

Response	Rural		Suburban		Urban		Total	
	n	%	n	%	n	%	n	%
Yes	11	52%	3	15%	4	19%	18	29%
No	9	43%	13	65%	15	71%	37	60%
I Do Not Know	1	5%	4	20%	1	5%	6	10%
No Response	0	0%	0	0%	1	5%	1	2%
Total	21	100%	20	100%	21	100%	62	100%

Table 5

Level of Concern about Fracking

Response	Rural		Suburban		Urban		Total	
	M	SD	M	SD	M	SD	M	SD
	2.19	0.93	2.55	1.1	3.57	1.33	2.77	1.12
	n	%	n	%	n	%	n	%
Not Concerned	6	29%	5	25%	2	10%	13	21%
Somewhat Concerned	6	29%	3	15%	2	10%	11	18%
Moderately Concerned	8	38%	8	40%	6	29%	22	35%
Highly Concerned	1	5%	4	20%	4	19%	9	15%
Very Highly Concerned	0	0%	0	0%	7	33%	7	11%
Totals	21	100%	20	100%	21	100%	62	100%

**M=mean, SD=standard deviation*

The status of teaching about fracking in American Government classrooms

While assessing participants responses there were several factors which impacted their decision on whether to teach about fracking in their classrooms. At issue are the nuanced layers of decision making which take place from curricular and pedagogical perspectives for teachers. Further, these decisions were significantly impacted by the intersectionality of their personal and professional identities through their roles as classrooms teachers and as members of the community surrounding the schools where they teach.

Just under half of all participants in this study (n=28; 45%) indicated they were teaching about fracking in the classroom as shown in Table 6. While teachers overwhelmingly believed fracking to be appropriate for the social studies and controversial, a slight majority were not teaching about it. Further, teachers who were teaching about fracking indicted they presented it as an economic

issue and not an environmental issue. This decision to bucket this issue as financial/economic and not environmental is significant as it shows that teachers were circumventing the environmental perspective. Instead making it financial which helps to alleviate the pressure due to the controversial nature of the issue.

Most participants indicated that fracking was an appropriate issue to address in the social studies classroom as shown in Table 7. Slightly over 80% of participants (n=51; 82%) indicated they believed it was acceptable to teach about fracking while slightly fewer than 20% (n=10; 16%) did not. Therefore, while an overwhelming majority of participants believed it should be taught, notably just over 75% (n=47; 76%) also believed it was controversial a controversial issue.

Table 6

Teaching about Fracking

Response	Rural		Suburban		Urban		Total	
	n	%	n	%	n	%	n	%
Yes	11	52%	9	45%	8	38%	28	45%
No	9	43%	11	55%	13	62%	33	53%
No Response	1	5%	0	0%	0	0%	1	2%
Total	21	100%	20	100%	21	100%	62	100%

Table 7

Fracking in the Social Studies

Answer	Rural		Suburban		Urban		Total	
	n	%	n	%	n	%	n	%
Yes	16	76%	17	85%	18	86%	51	82%
No	4	19%	3	15%	3	14%	10	16%
No Response	1	5%	0	0%	0	0%	1	2%
Total	21	100%	20	100%	21	100%	62	100%

It was important to understand participants knowledge of fracking because in most cases if a teacher is not knowledgeable of a topic, they may not teach about it. When asked if about their knowledge of fracking, most teachers believed they had some knowledge of fracking meaning they could not claim ignorance of its existence as shown in Table 8. Only 20% of participants indicated they had a high to very high level of knowledge about fracking (n=12; 19%) while 1/3rd (n=23; 37%) believed they had a sufficient knowledge base about fracking or only had some knowledge

(n=24; 39%). Nearly one-fifth of teachers Surprisingly, only three teachers (5%) indicated they had no knowledge about fracking. Interestingly, Rural (M=2.67, SD=.66) teachers' data illustrated they had less knowledge of fracking compared to the entire population (M=2.77; SD=0.95) while suburban teachers (M=2.9; SD=1.21) had slightly more knowledge. This is significant because fracking operations currently only occur in rural or suburban areas with none occurring in urban areas.

Table 8

Knowledge about Fracking

Response	Rural		Suburban		Urban		Total	
	M	SD	M	SD	M	SD	M	SD
	2.67	0.66	2.9	1.21	2.76	1	2.77	0.95
	n	%	n	%	n	%	n	%
None	0	0%	2	10%	1	5%	3	5%
Some	9	43%	6	30%	9	43%	24	39%
Sufficient	10	48%	7	35%	6	29%	23	37%
High	2	9%	2	10%	4	19%	8	13%
Very High	0	0%	3	15%	1	5%	4	6%
Total	21	100%	20	100%	21	100%	62	100%

Perceived barriers to teaching about fracking in participant classrooms

The barriers to teaching about fracking were, in most cases, internal. Often, teachers choose to teach about things found outside of the curriculum that have some level of importance to them. that are of interest. Participants in this study indicated their level of concern about fracking. Given that less than half of the participants were teaching about fracking it was not surprising that just over 25% (n=16) of participants were highly to very highly concerned about fracking whereas 75% (n=46) were not concerned to moderately concerned. Thus, at best, three out of four teachers were moderately concerned about fracking (n=46, 74%). This presents a barrier in that if one does not find an issue concerning or important, they will likely choose not to commit class time to that subject. Interestingly, even though fracking operations are more prevalent in rural participants school districts, the level of concern among suburban (M=2.55; SD=1.1) and urban (M=3.57; SD=1.33) teachers in this study was higher than among the rural teachers (M=2.19; SD=0.93). Urban teachers were the most concerned when compared to the entire sample (M=3.57, SD=1.33), and were the only group with teachers who indicated a very high level of concern, even though at

the time of this study no fracking operations were taking place in any urban area in Ohio as shown in Table 4.

Given that less than half of teachers were teaching about fracking it was important to understand what, specifically, may have prevented them from teaching about the subject. However, it was very surprising to learn that three out of four participants in this study (n=45; 73%) believed there were no barriers existed. This is very significant because it suggests that in the absence of any barriers, participants were simply choosing to not teach about fracking. Therefore, the teachers themselves were a significant barrier which is reflected in their perception of fracking's level of importance. Only 24% (n=15) of participants cited barriers as shown in Table 9. However, while half of urban teachers cited barriers only one rural participant responded there were any barriers.

Those participants who indicated that barriers did exist gave written responses. Themes that emerged were a lack of time, a lack of knowledge, no ready-made classroom resources, current curriculum standards demanding priority, and the belief that fracking was an issue best examined in science courses. Another look at the data reveals that teachers' responses indicating whether barriers existed to teaching about fracking depended upon the geographic location. Notably, rural teachers cited few barriers and indicated the lowest level of concern. The most frequently mentioned barriers included curriculum requirements, opposition from stakeholders, teachers' beliefs about the issue, and time constraints.

Table 9

Barriers to Teaching About Fracking

Response	Rural		Suburban		Urban		Total	
	n	%	n	%	n	%	n	%
Yes	1	5%	4	20%	10	48%	15	24%
No	18	86%	16	80%	11	52%	45	73%
No Response	2	10%	0	0%	0	0%	2	3%
Total	21	100%	20	100%	21	100%	62	100%

Another barrier to teaching about fracking was participants comfort level the issue of fracking. Most teachers were not teaching about fracking and felt only moderately comfortable with teaching about it as shown in Table 10. Only one out of four of the teachers in this study (n=16; 26%) felt highly to totally comfortable with teaching about fracking whereas nearly three out of five felt

only somewhat to moderately comfortable (n=37; 59%). Further, rural teachers illustrated a lower level of comfort (M=2.55, SD=.94) when compared to suburban (M=2.9; SD=1.29) and urban teachers (M=2.71; SD=1.23). Thus, teachers' decision to not teach about fracking, even though they believed it relevant may have been due to a lack of comfort with the topic.

Table 10

Comfort Level with Teaching About Fracking

Response	Rural		Suburban		Urban		Total	
	n	%	n	%	n	%	n	%
Not Comfortable	3	14%	2	10%	3	14%	8	13%
Somewhat Comfortable	6	29%	8	40%	8	38%	22	35%
Moderately Comfortable	8	38%	3	15%	4	19%	15	24%
Highly Comfortable	3	14%	4	20%	4	19%	11	18%
Totally Comfortable	0	0%	3	15%	2	10%	5	8%
No Response	1	5%	0	0%	0	0%	1	2%
Total	21	100%	20	100%	21	100%	62	100%

Discussion

Issues of energy use have become central to many conversations over the last decade. Specifically, the work of young environmental advocates like Greta Thunberg have raised the profile of issues like fracking to the forefront of many classroom conversations. However, this study highlighted that while popular sentiment regarding issues like fracking are changing, the teachers in this study were not addressing them. What made this surprising was that almost three fourths of participants (n=45; 73%) cited no existing barriers.

Overall, less than half of participants were teaching about fracking and those that were chose to present it as an economic issue rather than an environmental one. Notably, in the absence of barriers a majority were not teaching abut fracking. The barriers that were cited to teaching about fracking were framed around issues of time, materials, knowledge, and their belief that it was an issue best suited for a science course. However, a more nuanced look revealed that almost 75% of participants simply were not concerned about fracking while most participants did not have a strong comfort level with teaching about the topic. Broadly, the findings highlight the complex nature of deciding to teach about issues like fracking.

The average teacher makes countless decisions throughout the day and across the academic year regarding curriculum and pedagogy. Specifically, what to cover, when to cover it, and why should one cover it in their classroom. The results of this study showed that when it comes to fracking, most teachers were simply not teaching about for various reasons. This notion is connected to teacher autonomy in the classroom to be able to make curricular decisions and to feel supported in the process. Integral to all the decisions teachers make regarding what to teach and when to teach it are their personal backgrounds. The intersectionality of participants identities and where they find themselves is vital because one cannot separate oneself from any of the various roles each of us holds. A significant part of participants identity was their connectedness to their geographic location. Specifically, participants from different parts may have held different levels of autonomy. This played out in the responses with urban teachers having more concerns but teaching it less. However, rural teachers only slightly taught about fracking more than urban teachers but showed lower levels of concern. This is all important because self-reported fracking operations were happening more in rural areas than in any other areas.

This all suggests further direct exposure to fracking operations caused lower levels of concern. One may wonder if this is due to geographic tolerance. Additionally, this helps to explain why most participants framed fracking as an economic issue rather than an environmental one. Potentially, due to issues of energy independence, economic benefit of fracking in Ohio, and the mostly positive view of fracking as an overall beneficial endeavor. Furthermore, all fracking operations in Ohio were taking place in rural areas in locations which have seen decades of economic decline due to a reliance on industrial economies. This explains much in terms of why participants taught it the way they did and their self-reported levels of concern.

Overall, most participants were not teaching about fracking, cited few barriers, and were not very concerned. However, these responses differed depending upon the geographic location. Ultimately, the results of this study showed that much more data is needed to create a complete picture.

Implications and Further Research

This study has shown that a slightly less than half of participants are teaching about fracking in their classrooms while a clear majority of participants reported having no barriers to teaching about

fracking in their classrooms. However, most teachers were framing fracking through an economic lens and not as an environmental issue thereby minimizing fracking as a controversial environmental issue.

The foundation of social studies is civics education, and it is imperative that the notion of citizenship shift from personally responsible and participatory behavior to social justice-oriented behavior. To achieve this, preservice and in-service teachers need to be offered opportunities to foster social justice-oriented behavior and citizenship. Further, social studies teachers should be more inclusive of place-based education. It is unreasonable to expect social studies teachers to engage their students in civic behaviors with which they themselves have no experience. Additionally, social studies must expand the notion of citizenship to include environmental awareness and environmentally responsible behavior. This must coincide with expanding the definition of citizenship to include environmental issues as relevant to the social studies. Social studies teachers and students must understand and agree that environmental issues are social issues. Doing this could do much to reduce potential barriers to teaching about controversial environmental issues. However, it is imperative that teacher education programs respond to these changes.

How we prepare social studies teachers must include focused and direct opportunities to learn and teach about controversial and environmental issues. Specifically, these experiences must include how to teach students to navigate controversial and environmental issues and how to adequately deal with potential barriers they may encounter. It is essential that teachers are cognizant of their personal perspectives on specific controversial issues before they engage their students in discussion. To achieve this objective Hess' (2005) model for assessing teachers' approaches to controversy, denial, privilege, avoidance, and balance should be expanded to include balanced privilege. Teachers must not be made to feel inadequate for sharing their personal perspective while still presenting multiple divergent perspectives to their students. Instead, teachers should be inclined to share their opinions as an act of educational trust in their students.

It is undeniable that teachers rely upon national and state academic standards as a basis for their instruction. While many go beyond these standards, the inclusion of content and activities would go a long way towards increasing awareness and action involving environmental issues such as fracking. Furthermore, the National Curriculum Standards for Social Studies, the Ohio Learning Standards, NCSS' C3 curriculum, and the Common Core, should all be expanded to move beyond

sustainability and sustainability practices to include environmental awareness, understanding, and action. Controversial environmental issues such as fracking are social issues equal to others such as immigration, abortion, and gay rights. It is important that teachers understand the dynamic nature of these issues. Prior research has already indicated that issues such as fracking have been traditionally viewed as best suited for the sciences. However, to overcome this issue teacher preparation programs and high schools need to foster professional development and curricular opportunities that focus on the social nature of environmental issues such as fracking. This will allow preservice and in-service teachers to better understand such issues.

Further research is needed to better understand the ways in which participants are teaching in their classrooms. This data was limited to participant self-reporting which leaves much of the classroom decisions and experiences unexamined. Future research which focused on what teachers were doing by conducting field observations and document analysis of lessons plans and student assignments would yield a much deeper understanding what participants say they are doing and are doing in their classrooms. It would also be beneficial to expand the sampling to include more teachers across multiple grades. This work is important to understanding how issues like fracking are or are not being taught in social studies classrooms during a time of unprecedented climate awareness and potential upheaval.

References

Alter, C., Haynes, S., and Worland, J. (2019, December). Time 2019 person of the year: Greta Thunberg. *Time*. Retrieved from https://time.com/person-of-the-year-2019-greta-thunberg/

American Historical Association. (1899). *The study of history in schools: Report by the Committee of Seven.* New York: McMillan.

Anderson C, Avery PG, Pederson PV, et al. (1997) Divergent perspectives on citizenship education: a q-method study and survey of social studies teachers. *American Educational Research Journal 34*(2): 333–364

Beard, C.A. (1929). The trend in social studies. *The Historical Outlook, 20,* 369-372.

Belcher, M., & Resnikoff, M. (2013). Hydraulic Fracturing Radiological Concerns for Ohio. Retrieved from https://www.fractracker.org/a5ej20sjfwe/wp-content/uploads/2017/03/13-6-Resnikoff-hilited-Hydraulic-Fracturing-Radiological-Concerns-for-Ohio.pdf

Bromley, P., Meyer, J. W., & Ramirez, F. O. (2011). The worldwide spread of environmental discourse in social studies, history, and civics textbooks, 1970-2008. *Comparative Education Review*, *55*(4), 517-545.

Camicia, S. P. (2008). Deciding what is a controversial issue: A case study of social studies curriculum controversy. *Theory and Research in Social Education*, *36*(4), 298-316.

Camicia, S.P. & Dobson, D. (2010). Learning how to respond to current events: Partner journals between U.S. preservice teachers and children. *Teaching and Teacher Education,* 26, pp.576-882.

Ceaser, D. (2012). Our school at Blair grocery: A case study in promoting environmental action through critical environmental education. *Journal of Environmental Education*, *43*(4), 209-226.

Chin, K., & Barber, C. E. (2010). A multi-dimensional exploration of teachers' beliefs about civic education in Australia, England, and the United States. *Theory and Research in Social Education*, *38*(3), 395-427.

Creswell, T. (2004). *Place: A short introduction*. Malden, MA: Blackwell Publishing.

Creswell, J. W., & Creswell, J. D. (2017). *Research design: Qualitative, quantitative, and mixed methods approaches*. New York: Sage publications

DiChristopher, T. (2019, March). US will soon threaten to topple saudia arabia as the world's top oil exporter: IEA. *CNBC*. Retrieved from https://www.cnbc.com/2019/03/11/us-threatens-to-topple-saudi-arabia-as-worlds-top-oil-exporter-iea.html

Deveci, H. (2007). Teachers' views on teaching current events in social studies. *Educational Sciences, Theory & Practice*, *7*(1), 446-451.

Dewey, J. (1923). *Democracy and education: An introduction to the philosophy of education*. New York, New York: Macmillan.

Dolesh, R. J. (2011). Fracktured parks. *Parks & Recreation*, *46*(6), 56.

EcoWatch. (2011, December). *Breaking: Fracking compounds found in drinking water*. Retrieved from http://ecowatch.com/2011/12/08/fracking-compounds-found-in-drinking-water

Eller, R.D. (2008). *Uneven ground: Appalachia since 1945*. Lexington, Kentucky: University of Kentucky Press.

Evans, R.W. (2004). *The social studies wars: What should be we teach the children?* New York: Teachers College.

Gjelten, T. (2012). The dash for gas. *World Affairs* retrieved from http://www.worldaffairsjournal.org/article/dash-gas-golden-age-energy-game-changer

Hahn, C. L. (1991). Controversial issues in social studies. In J. P. Shaver (Ed.), *Handbook of research on Social Studies Teaching and Learning* (pp. 470-480). New York, NY: Macmillan.

Hahn, C. L. (1996). Research on issues-centered social studies. In R. W. Evans & D. W. Saxe (Eds.), *Handbook on Teaching Social Issues* (pp. 26-39). Washington, DC: National Council for the Social Studies.

Haas, M. E., & Laughlin, M.A. (2000). *Teaching current events: Its status in social studies today*. Paper presented at the Annual Meeting of the American Educational Research Association, New Orleans, LA.

Hatzenbuhler, H., & Centner, T. J. (2012). Regulation of water pollution from hydraulic fracturing in horizontally-drilled wells in the Marcellus shale region, USA. *Water 4*(4), 983-994. doi:10.3390/w4040983

Helman, C. (2013, January). An investigation of the global anti-fracking movement. *Forbes.* Retrieved from http://www.forbes.com/sites/energysource/2013/01/02/an-investigation-of-the-global-anti-fracking-movement/

Hess, D. (2002). Discussing controversial public issues in secondary social studies classrooms: learning from skilled teachers. *Theory and Research in Social Education*, *30*(1), 10-41.

Hess, D. (2004). Discussion in social studies: Is it worth the trouble? *Social Education, 68*(2), 151-155.

Hess, D. (2005). How do teachers' political views influence teaching about controversial issues. *Social Education, 69*(1), 47-48.

Hess, D. (2008). Controversial issues and democratic discourse. In L. S. Levstik & C. A. Tyson (Eds.), *Handbook of Research in Social Studies Education* (pp. 124-136). New York, NY: Routledge.

Hess, D. (2009). *Controversy in the classroom: The democratic power of discussion*. London, England: Routledge.

Hollstein, M. S., & Smith, G. A. (2020). Civic environmentalism: Integrating social studies and environmental education through curricular models. *Journal of Social Studies Education Research, 11*(2), 223-250.

Jorgensen, C. (2013). Moral problems as issues-centered social studies education: Discovering Dewey as a guiding foundation. *International Journal of Progressive Education, 9*(1), 41-58.

Journell, W. (2011). Teachers' controversial issue decisions related to race, gender, and religion during the 2008 presidential election. *Theory and Research in Social Education, 39*(3), 348-392.

King, J. T. (2009). Teaching and learning about controversial issues: lessons from Northern Ireland. *Theory and Research in Social Education, 37*(2), 215-246.

Kelly, T.E. (1986). Discussing controversial issues: Four perspectives on the teacher's role. *Theory and Research in Social Education, 14*(2), 113

King, J. T. (2009). Teaching and learning about controversial issues: lessons from Northern Ireland. *Theory and Research in Social Education, 37*(2), 215-246.

Kumler, L. M. (2011). Students of action? A comparative investigation of secondary science and social studies students' action repertoires in a land use context. *Journal of Environmental Education*, *42*(1), 14-29.

Libresco, A. S. (2003). Current events matters for elementary social studies methods students. *International Social Studies Forum, 3*(1), 273-276.

Lipscomb, G.E., & Doppen, F.H. (2013). Finding one's place in the world: Current events in the K-12 social studies classroom. In J. Passe, & P. Fitchett (Eds.) *Research on the status of social studies: Views from the field* (pp. 447-456). Charlotte, NC: Information Age Publishing Co.

Levinson, B. A. U. (2003). Hopes and challenges for the new civic education in Mexico: Toward a democratic citizen without adjectives. *International Journal of Educational Development, 24,*269-282

Levinson, B. U., & Brantmeier, E. J. (2006). Secondary Schools and Communities of Practice for Democratic Civic Education: Challenges of Authority and Authenticity. *Theory and Research in Social Education, 34*(3), 324-346.

Luckhardt, C. (2014). Teaching historical literacy and making world history relevant in the online discussion board. *History Teacher*, *47*(2), 187-196.

McKibben, B. (2011). *Eaarth: Making a life on a tough new planet*. Random House LLC.

Misco, T., & Patterson, N. C. (2007). A study of pre-service teachers' conceptualizations of academic freedom and controversial issues. *Theory and Research in Social Education*, *35*(4), 520-550.

National Council for the Social Studies. (1921). *The Historical Outlook, 12,* 144.

National Council for the Social Studies. (2010). *National curriculum standards for social studies: A framework for teaching, learning, and assessment.* Silver Spring, MD: Author

National Council for the Social Studies. (2013). *College, career, and civic life (c3) framework for social studies state standards: Guidance for enhancing the rigor of k-12 civics, economics, geography, and history*. Silver Spring, MD: Author. Retrieved from http://www.socialstudies.org/c3

North American Environmental Education Association. (2019, December). Guidelines for excellence: Best practices in ee. Retrieved from https://naaee.org/our-work/programs/guidelines-excellence

Ogunyemi, B., & Ifegbesan, A. (2011). Environmental literacy among preservice social studies teachers: A review of the Nigerian experience. *Applied Environmental Education and Communication, 10*(1), 7-19.

Ohio Department of Natural Resources (ODNR). (2014, March). Shale well drilling and permitting. Retrieved from http://oilandgas.ohiodnr.gov/shale

Ohio Department of Natural Resources (ODNR). (2019. December 10). Shale well drilling and permitting. Retrieved from http://oilandgas.ohiodnr.gov/shale

Palmer, J. A. (1999). Research matters: A call for the application of empirical evidence to the task of improving the quality and impact of environmental education. *Cambridge Journal of Education*, *29*(3), 379-395.

Pass, S. (2007). Exploring teaching ethics in social studies. *International Journal of Social Education, 21*(2), 62-78.

Patterson, N, Doppen, F., & Misco, T. (2012). Beyond personally responsible: A study of teacher conceptualizations of citizenship education. *Education, Citizenship, and Social Justice*, 7(2), pp 191-206

Patton, M.Q. (2002), *Qualitative research and evaluation methods* (3rd ed.) Sage Publications Thousand Oaks, CA.

Pescatore, C. (2007). Current events as empowering literacy: For English and social studies teachers. *Journal of Adolescent & Adult Literacy*, *51*(4), 326-339.

Resor, C.W. (2010). Place-based education: What is its place in the social studies classroom. The *Social Studies, 101*(5), 185-188.

Risinger, C.F. (2009). Citizenship education: The goal of education. *Social Education, 73(7), pp. 330-331.*

Seneschal, E. (2007). Environmental justice in egleston, square. In *Place based education in a global age: Local diversity*, ed. D.A. Gruenewald and G.A. Smith, 85-111. New York: Taylor and Francis Group.

Sharp, K. A. (2009). A survey of Appalachian middle & high school teacher perceptions of controversial current events instruction. *Online Submission*,

Slack, B. (2013). Environmental fracturing vs. fracking: while 'fracking' is the subject of much contention in political and social arenas, environmental fracturing continues to make quiet headway. Pollution Engineering, (9). 18.

Sobel, D. (2004). *Place-based education: Connecting classrooms and communities*. Barrington, MAOrion Society.

Thornton, S. J. (1989, March). *Aspiration and practice: Teacher as curricular-instructional gatekeeper in social studies* [Paper session]. American Educational Research Association, San Francisco, California, United States. https://eric.ed.gov/?id=ED315347

Thornton, S. J. (1991). Teacher as curricular-instructional gatekeeper in social studies. In J.S. Shaver (Ed.) *Handbook of research on social studies teaching and learning* (p. 237-248). Macmillan.

Tzou, C. T., & Bell, P. (2012). The role of borders in environmental education: Positioning, power and marginality. *Ethnography and Education*, *7*(2), 265-282.

US Energy Information Administration. (2011, July 08). *Review of emerging resources: U.S. shale gas and shale oil plays*. Retrieved from http://www.eia.gov/analysis/studies/usshalegas/

Washington E.Y. & Humphries, E. (2011). A social studies teacher's sense making of controversial issues discussions of race in a predominantly white, rural high school classroom. *Theory and Research in Social Education, 39*(1), 92-114.

Wilson, E. O. (2006). *The creation: An appeal to save life on earth*. New York: Norton.

Zuckerman, G. (2013). The Frackers: The outrageous inside story of the new billionaire wildcatters. New York, New York: Penguin Publishing.

Appendix A: Survey

Status of the Teaching of Hydraulic Fracturing in Ohio American Government Classrooms

Questionnaire

Directions

The Status of Teaching about Fracking Survey

1. What is the purpose of social studies?

2. What is the purpose of civics education?

3. Which of the following items is most vital to good citizenship?
    a. Being Personally Responsible
        i. Example: I am a good citizen. In my personal life, for example, I recycle because I care about the environment.

    b. Being Participatory
        i. Example: I am an active citizen, for example I go out in the community and help organize a campaign to promote recycling.
    c. Being Justice Oriented
        i. Example: I care about social justice, for example I question why my city doesn't recycle and why some citizens don't. I actively try to get my government and citizens to support recycling.

4. Do you require your students to engage in civic activities, such as voting drives, volunteering in the community, or engaging local government officials in community issues? If yes, please list and explain. If no, why not
    a. Yes
    b. No

5. How often do you teach about current events?
    a. Never
    b. Occasionally
    c. Monthly
    d. Weekly
    e. Daily

6. How do you address current events in your classroom? Please describe.

7. Do you believe current events instruction should be a major component of the social studies?
    a. Yes
    b. No

8. Do you teach about current environmental events/issues in your classroom? If so, how? If not, why not?
    a. Yes
    b. No

9. In your opinion, what, if any, is the value of teaching about current environmental events?

10. In your opinion, what makes an issue controversial?

11. How often do you teach about controversial issues in your classroom?
    a. Never
    b. Occasionally
    c. Monthly
    d. Weekly
    e. Daily

12. Do you address controversial issues in your classroom? If so, what are some of those issues?

13. What, if any, barriers exist that might prevent you from teaching about controversial issues?

14. How would you characterize your approach to teaching about controversial issues? Please select the statement that best describes your approach.
    a. Even though some people might think something is controversial, I might not.
    b. Even though an issue might be controversial, I don't mind favoring one position over another.
    c. When an issue is controversial but I believe more strongly in favor of one position, I prefer to avoid the controversial issue in my classroom.
    d. When an issue is controversial, I make sure not share my opinion and present all sides equally.
    e. If I feel an issue is controversial, I tell my students my opinion to let them know where I stand and then try to present all sides of the issue equally.

15. How would you rate your level of concern of environmental issues?
    a. Not Concerned
    b. Somewhat Concerned
    c. Moderately Concerned
    d. Highly Concerned
    e. Very Highly Concerned

16. Do you teach about environmental issues in your classroom? Why/why not?
    a. Yes

b. No

17. Please rate your level of agreement with the following statement: The social studies curriculum should include controversial environmental issues.
    a. Strongly Disagree
    b. Disagree
    c. Neutral
    d. Agree
    e. Strongly Agree

18. Hydraulic fracturing (fracking) is a technique used by energy companies in which they drill vertically and then horizontally into shale formations in order to crack the shale formation with high pressure fluids to release natural gas and oil. Please rate your level of concern about this issue.
    a. Not Concerned
    b. Somewhat Concerned
    c. Moderately Concerned
    d. Highly Concerned
    e. Very Highly Concerned

19. How would you rate your level of knowledge of the process of hydraulic fracturing?
    a. None
    b. Some
    c. Sufficient
    d. High
    e. Very Highly

20. Is hydraulic fracturing taking place in your community?
    a. Yes
    b. No
    c. I don't know

21. Have any energy industry companies offered professional development or educational sessions related to fracking in your school community? If yes, did you participate, why/why not?
    a. Yes
    b. No
    c. I don't know

22. Do you believe hydraulic fracturing to be an appropriate topic in the social studies curriculum?
    a. Yes
    b. No

23. Do you believe hydraulic fracturing is controversial? Why/why not?
    a. Yes
    b. No
    c. I don't know

24. Do you teach about hydraulic fracturing in your classroom? Why/why not?
    a. Yes
    b. No

25. Are there any barriers that might prevent you from teaching about fracking? If yes, what barriers? Please explain.
    a. Yes
    b. No

26. Considering your own level of knowledge, how comfortable do or would you feel teaching about hydraulic fracturing?
    a. Not comfortable
    b. Somewhat comfortable
    c. Moderately comfortable
    d. Highly comfortable
    e. Totally comfortable

Background Information

27. In what school district do you currently teach?

28. How many years of teaching experience will you have at the end of this school year?
    a. 1
    b. 2-5
    c. 6-10
    d. 11-15
    e. 15-20
    f. 20-25
    g. 25+

29. How many years of teaching experience in your current district will you have at the end of this school year?
    a. 1
    b. 2-5
    c. 6-10
    d. 11-15
    e. 15-20
    f. 20-25
    g. 25+

30. What is your gender?

a. Male
b. Female

31. Which of the following best represents your ethnic background??
    a. White, non-Hispanic
    b. Hispanic
    c. Black, non-Hispanic
    d. American Indian or Alaska Native
    e. Asian or Pacific Islander
    f. Multi-racial
    g. Other

32. Would you be willing to participate in a personal follow-up interview? If so, please provide your contact information below.
    a. Name
    b. Telephone Number
    c. Email address

School