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UNIVERSITY OF CALIFORNIA,
IRVINE

Using Controversial Issues to Help Middle School Students Become Informed and Active
Citizens: A Randomized Evaluation of the Word Generation Program

DISSERTATION

submitted in partial satisfaction of the requirements
for the degree of

DOCTOR OF PHILOSOPHY

in Education Policy and Social Context

by

Alex Romeo Lin

Dissertation Committee:
Assistant Professor Joshua Lawrence, Chair
Associate Professor Thurston Domina
Professor Dr. George Farkas

2014

DEDICATION

To

My family and friends

In recognition of their worth

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ACKNOWLEDGMENTS

There are many people to whom I am grateful. First, I would like to express my appreciation to Dr. Joshua Lawrence who chaired my committee. He provided guidance and inspiration throughout the development of this dissertation. Both his advice and feedback have been critical through each step of the dissertation process. Also, his high expectations and support demonstrated his care about my work and progress as a scholar. Thank you to my dissertation committee members, Dr. Thurston Domina and Dr. George Farkas whose expertise and supportive suggestions have also strengthened my dissertation. I also owe thanks to Dr. Laura Wray-Lake, who provided invaluable feedback on the direction and substantive content of my dissertation.

This research was supported with funds from Harvard University and the Institute of Education Science (IES) (#R305A090555). To these supporters, I am extremely grateful. More specifically, I am thankful to Dr. Catherine Snow from Harvard University and director of the Boston Field Site of the Strategic Education Research Partnership (SERP) for her leadership in the research and development of the Word Generation program. Dr. Juliana Pare-Blagoev, former Assistant Director in SERP's national headquarters, for her expertise of the Word Generation program. Patrick Hurley, the SERP director of the participating school district, in supporting work of this dissertation study.

There are several people at the School of Education at UC Irvine that must also be acknowledged. I feel fortunate to have such an amazing collection of scholars to support my development as a scholar. First, Dr. Gilberto Conchas, my first faculty advisor, supported me through the early years and developing my research interest on youth from underserved populations. Dr. Deborah Vandell and Dr. Pilar O' Cadiz for their leadership and giving me the opportunity to conduct evaluation work on a state-wide afterschool program. I learned so much working with my fellow graduate researchers in the Literacy Intervention and Instruction Group (Faculty sponsor: Dr. Joshua Lawrence): Jin Kyoung Hwang, Soobin Yim, Joanna Yau, and Rachel Stumpf. I also have to acknowledge two of my best friends and colleagues, Ernest Johnson and David Lee. Each of them brought me perspective and intellectual growth, as well as many laughs.

This dissertation is dedicated to my father, Dr. George (Tsong-Yi) Lin who made substantial contributions in the field of clinical chemistry. My father received his doctorate in Biophysics at Ohio State University. He served 14 years (1977-91) as professor at Baylor Medical University and 4 years (1991-1995) as department chair and professor of Chemistry at National Taiwan University. He published over 40 articles in peer-reviewed journals on various topics on fluorescence spectroscopies, bio-analytical, protein and enzyme biochemistry and biophysical techniques. Above all, he was a great father who instilled strong work ethics, integrity, and ambition in raising his three talented sons. Although his legacy was cut short by his terminal illness, it is an honor for me to carry my father's passion for research and science into my current research endeavors.

Last, I want to extend gratitude to my family. After his passing, my mother, Rachel Lin, carried the burden of raising my two brothers and me. Her love and support helped me believe in the importance of following your dreams. Finally, I thank my wife, Kristen Lin for her endless patience while I worked on my dissertation. Her support and encouragement always meant the world to me.

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ABSTRACT OF THE DISSERTATION

Using Controversial Issues to Help Middle School Students Become Informed and Active Citizens: A Randomized Evaluation of the Word Generation Program

By

Alex Romeo Lin

Doctor of Philosophy in Education Policy and Social Context

University of California, Irvine, 2014

Professor Joshua Lawrence, Chair

Although American schools are required to meet civic education goals of preparing students to become active and informed citizens, high quality civic opportunities (e.g. service learning and volunteering) are consistently less available to youth of color who are typically enrolled in schools located in high poverty communities. The purpose of this study is to evaluate the efficacy of the Word Generation (WG) to improve students' self-reported civic engagement ($N = 5,798$) in the context of a randomized trial that was conducted in several middle schools located in a West Coast metropolitan area of the United States. WG is a cross-content program that instructs students to learn academic words, which are embedded in brief passages covering a different controversial issue each week. Participants completed survey items on how often they help their friends, community, and school, as well as voting interest. Results provide support for the primary research question- participation in the Word Generation program has a significant impact on students' self-reported civic engagement, but not for voting interest. These results suggest that students' opportunities to debate on social issues are crucial to envisioning oneself as an active participant in civic affairs.

INTRODUCTION

This dissertation study will explore whether an issues-centered curricula implemented in middle schools can improve civic engagement among adolescents from diverse ethnic/racial backgrounds. Word Generation (WG) is a cross-content literacy program that instructs students to learn academic vocabulary by exposing them to a broad range of political and science-based controversies that can be used for instructions and classroom discussions. Evaluation of the Word Generation program will involve several goals including: (1) examining classroom discussion quality (2) determining possible treatment effects on students' self-reported civic engagement, and (3) understanding the relationship between classroom discussion and program effects. These research questions are assessed by analyzing data collected from a randomized trial of the Word Generation that was conducted in a West Coast metropolitan area school district where twelve middle schools participated in treatment and control conditions. The results of the study may lead to recommendations that consider how Word Generation or similar program can be used in schools to improve the declining civic engagement rates found among young people.

This Introduction provides an overview of the problem and background information on civic engagement that includes attention to adolescents, ethnic/racial minorities, and issues concerning the school setting. In the next section of the Introduction, I state three related objectives guiding this evaluation of the Word Generation program. The last section of the Introduction contains definitions of key terms: civic engagement, issues-centered curricula, and controversial issues.

Chapter 1 presents a literature review that describes the study's theoretical framework and discusses prior empirical research useful for understanding how issues-centered curricula are evaluated. Chapter 2 is an overview of the project's research design, sample and analytic

strategy. Results from an evaluation of the Word Generation program are presented in Chapter 3. In Chapter 4, I discuss the significance of the findings and their contributions to the literature. The dissertation concludes with a discussion of the study's limitations and exploration of future research directions.

Problem Statement and Background

More than half of eligible young people (aged 18-29 years old) did not vote in the 2012 elections, raising concerns about the political health of this country (CIRCLE, 2013). According to Adler and Googin (2005), fulfilling one's civic duty to vote is connected to a broader field of civic engagement, which includes the community context (e.g. volunteering and helping a neighbor) and electoral context (e.g. voting, donating money to political party/candidate and protesting). In fact, international reports on youths conducted by the World Bank (2007) report that *civic engagement* is one of the most important markers of adult transition, alongside school completion, attainment of health, employment and family formation (Kassmir & Flanagan, 2010). More specifically, civic engagement may be associated with higher rates of leadership development and positive socio-emotional skills (Hansen, Larson & Dworkin, 2003).

As much as family, culture and media can influence youth to become active in their communities, schools can also play a pivotal role in providing civic learning opportunities to adolescents (Gibson & Levine, 2003). Practitioners and scholars developed the landmark report called *The Civic Mission of Schools* (2003), which highlighted the school's capacity to provide four key civic learning opportunities: discussions of controversial issues, participation in school governance, simulation of democratic procedures, and extracurricular community involvement (Carnegie and CIRCLE, 2003). To support the school's civic mission, issues-centered curricula have been designed to provide students with these civic learning opportunities. Unfortunately,

these issues-centered curricula are limited to high school social studies courses and schools located in middle-class and suburban communities (Feldman, Pasek, Romer, & Jamieson, 2007; Niemi & Junn, 2005) As a result, civic learning opportunities are increasingly rare for students enrolled in schools located in low-income communities (Hart & Atkins, 2002). An issues-centered curriculum called Word Generation (WG) provides students with key civic learning opportunities by supporting daily instruction and discussions of controversial issues. A randomized trial of the WG program was conducted in several middle schools located in an urban school district with an ethnic/racially diverse student population. This dissertation examines whether participating in this intervention results in positive effects on students' self-reported civic engagement.

Civic engagement development among early adolescence

In early adolescence (aged 11-14 years old), youth start to explore their roles in society and the community at large (Nakkula & Toshalis, 2010). Upper elementary grade children have developed an early awareness of basic democratic foundations, such as government processes and civil liberties (Helwig, 2006; Hess & Torney, 1967; Moore, Lare, & Wagner, 1985). At this age they also demonstrate more complex thinking as it relates to engaging in self-reflective thinking and perspective taking (Rice, 1998). By the time these youth reach middle school, adolescents spend more time with their peers and this relationship with peers is especially important because they have increased opportunities for independent activities (Larson, Wilson, Brown, Furstenberg, & Verma, 2002). Based on these important socializing opportunities, youth in this early adolescence period can explore their understandings about democracy and civic engagement in the context of their real-world connections with the larger community.

Although youth in their early adolescence may be capable of experiencing more formal civic learning opportunities at school, these learning opportunities are usually delayed to late high school. Issues-centered curricula (e.g. Cityworks, Student Voices, Kids Vote, Project Citizen) are generally used in 11th and 12th grade social studies classes (11th-12th grades) (Kahne, Chi, & Middaugh, 2006; Lin, 2013; Root, Northup, & Turnbull, 2007). One reason is that 11th and 12th grade students are one to two years away from being eligible voters (18 years old). Middle school students may be at high risk of not developing key social and behavioral skills if they are not given civic learning opportunities at school (Flanagan, Cumsille, Gill, & Gallay, 2007; Morgan & Streb, 2001). More understanding is needed to identify and promote civic learning opportunities for youth in this early adolescence period.

Low civic engagement development among ethnic/racial minorities

This section discusses the increasing presence of ethnic/racial minorities in schools, in particular to Asian and Hispanic youth. In comparison with other racial minorities, Hispanics account for a significant percentage of the nation's growth (56%) and represent 16.3% of the total population as reported by the U.S. Census in 2010 (DeNavas-Walt, Proctor, & Smith, 2010). From 1990 to 2006, Asian Americans (e.g. Asian Indian, Chinese, Japanese and Koreans) have increased by 90% and accounts for 4% of the total population (Sundeen, Garcia, & Wang, 2007). More understanding is needed to identify ways of helping youth from these populations become more civically engaged.

The Center for Information and Research on Civic Learning and Engagement (CIRCLE) is the leading source of research on civic engagement among American youth. CIRCLE released a 2007 report based on survey results from the 2006 Civic and Political Health of the Nation Survey taken by 1,300 youth aged 15-25 years old. The report indicates that Hispanic youth were

lagging behind their White, Asian, and African American counterparts in various civic engagement activities including: volunteering for a non-political group, engaging in community solving, and voicing their political opinions (e.g. contacted an elected official, signed a petition, and joined a boycott). Compared to their non-Hispanic counterparts, Hispanic voters (20 years and older) had the lowest voting turnout and were more likely to report voting as a *choice* rather than a duty or responsibility. One explanation of these findings is that Hispanic youth often have significant work and household responsibilities, which limits their time to engaging in civic activities (Perez, Espinoza, Ramos, Coronado, & Cortes, 2010). Also, Hispanic youth tend to reside in urban cities, where there are less frequent opportunities to engage in structured activities with adult supervision (e.g. voluntary associations, sports, and community service) than in suburban areas (Hart, Atkins & Ford, 2010).

The CIRCLE (2007) report also suggests that Asian American youth, on average, were more civically engaged than African American and Hispanic youth. However, Asian American youth were still lagging behind their counterparts in several key areas: volunteering for a charity, belonging to a political association and discussing current events with friends and family. Relative to what is known about the civic engagement of Hispanic youth, far less is known about the barriers limiting Asian American youth from participating in civic activities. Several studies focusing on recent Asian immigrants suggest that civic engagement may vary depending on the strength of ethnic ties to their former countries (Sundeen, Garcia, & Wang, 2007; Uslander & Conley, 2003). In a study on the volunteering behaviors of Asian Indian, Chinese and Filipino adults, Sundeen and his colleagues (2007) report that ethnic minorities with stronger ethnic ties – especially those who are in close geographic proximity to self-contained ethnic communities –

are less likely to participate in certain political activities, such as voting and following American politics. This study devotes close attention to youth who identify as ethnic/racial minorities.

Schools located in high poverty neighborhoods are less likely to provide high quality teaching and instructional resources than those in more affluent areas (Boyd, Lankford, Loeb, Rockoff, & Wyckoff, 2008). This finding is particularly relevant for ethnic/racial minorities who are likely to attend schools in high poverty areas (Aud, Fox, & KewalRamani, 2010). Similarly, high quality civic learning opportunities are also consistently less available to ethnic/racial minority youth (Levinson, 2012). In a study of students' experiences ($N = 2,366$) in high school social studies classes, students who identified as Asian, Filipino or Pacific Islander were less likely to report having discussions of controversial issues and freedom to express their ideas in comparison with their Caucasian counterpart (Kahne & Middaugh, 2008). Also, Hispanic students were less likely to experience freedom to express their ideas. In contrast, students with high educational aspirations (as indicated by post-secondary plans) and high academic GPA were more likely to experience frequent civic learning opportunities. These findings support attention to increasing civic learning opportunities for students from diverse ethnic/racial backgrounds (Hartry & Porter, 2004; Kahne et al., 2006; Syvertsen et al., 2009). The strength of this dissertation is expanding research so that schools can consider possible solutions to improving civic engagement among youth from ethnic/racially diverse populations.

Using issues-centered curricula in schools

Recent reports released by the National Council of Social Issues (2007) and the Center for Information and Research on Civic Learning and Engagement (2013) emphasize that schools can expose students to learning about controversial issues or socially relevant issues that spark significant disagreements. For example, a debate on whether the government should fund stem

cell research has the potential of sparking disagreement because there may be varying opinions regarding human ethics violations and supporting medical advances. Controversial issues are characterized as having three primary functions that can be beneficial to students' civic engagement development: (1) develop working knowledge on the issue, (2) understand the *unresolved* nature of the issues, and (3) explore possible solutions to addressing the issue (Hess & Posselt, 2002). Teachers can consider using issues-centered curricula or curricula material that prescribes a set of classroom activities devoted to learning controversial issues. A majority of these issues-centered curricula are implemented in social studies classes, though a few are designed for English language arts. These issues-centered curricula may be effective because they share a comprehensive approach to providing civic learning opportunities, such as mock-voting, role-playing, and classroom discussions (Lin, 2013). These civic learning opportunities represent a cognitive form of civic engagement that enables students to envision themselves as active participants in the community (Hively & Eveland, 2009). The next section is an overview of a literacy intervention called Word Generation that serves as the focus in this dissertation study.

The Word Generation Program

The focus of this study is to evaluate the Word Generation (WG) program and its potential to improve students' civic engagement. Word Generation is a cross-content literacy program delivered at the classroom or grade level that instructs students to learn five all-purpose academic words, which are embedded in brief passages covering a different controversial issue each week (Snow, Lawrence, & White 2009). The program features controversial topics based on a broad range of political and science-based controversies, such as whether the government should fund stem cell research or animal testing. As part of the WG program, teachers in the four

main content areas – ELA, social studies, science, and math – present materials related to the controversial issue of the week and explore academic language that is embedded in the curriculum through discourse and writing (Snow et al., 2009). For fifteen minutes a day, teachers and students engage in program activities related to vocabulary instructions and classroom discussions.

Here is an example of how a week’s activities are organized, with each week following a similar sequence (See Figure 1). On Monday, the ELA teacher presents a text that starts with a narrative about a girl who was accidentally shot and paralyzed, but for whom stem cell research might offer a cure; the rest of the brief text presents arguments against (religious objections, use of embryos) and in favor of federal funding of stem cell research (scientific and medical advances, global competitiveness). The math teacher provides a lesson that prompts students to calculate how many stem cells are in the human body. On Wednesday, the social studies teacher facilitates debate with the whole class, where students can choose to defend arguments for or against funding stem cell research. Given sufficient time, students also have opportunities to rebut the opposing group’s argument. The science teacher assigns an experiment where students hypothesize and test whether their peers have correct assumptions about stem cells. On Friday, the ELA teacher assigns a writing exercise that prompts students to write a persuasive essay defending their position on the topic. The weekly sequence was developed to provide students with recurrent exposure and opportunities to learn about the controversial topics in various subject-specific contexts (Snow et al., 2009).

Various studies have been conducted on quasi-experimental and experimental trials of the WG program that was implemented in several urban school districts across the United States. A broad range of research topics has been explored including: writing outcomes (Mancilla-

Martinez, 2010), vocabulary development (Lawrence, Capotosto, Branum-Martin, & Snow, 2012), and differentiated effects for English language learners (Hwang, Lawrence, Mo, & Snow, 2014). The author (Lin, Lawrence, & Snow, 2012) found that the WG program improved students' communicative self-efficacy to publicly discuss controversial issues, which is an outcome considered as a *precursor* to civic engagement (Kim & Ball-Rokeach, 2006; Hackler, Ho, & Urquhart-Ross, 1974). This current project builds on this past evaluation to assess whether the WG program can improve students' self-reported civic engagement. The unique strength of the WG program is that responsibility of educating students about controversial issues falls on not just social studies, but also ELA, math, and science teachers.

	Monday English	Tuesday Science	Wednesday Math	Thursday Social Studies	Friday English
WG Activity	Weekly passage & Word Chart	Fictional experiment	Problem of the week	Debating the issue	Taking a stand essay
Purpose	Establish word meaning	Establish science version of the definition	Apply the words in the context of math problems	Students take position on the issue	Composition of a short essay (open response)
Process	Comprehend the gist of the passage	Analyze data in fictional micro-experiment	Discuss and solve math problems	Teacher facilitates classroom debate	

Figure 1. Sample Weekly Schedule of the WG Program

Purpose of the Study

This study seeks to accomplish three related objectives. First, this project discusses the literature on how schools can help students to become civically engaged through issues-centered curricula that can be used in the classroom. Next, the most important objective consists of evaluating whether the WG program has a positive impact on students' self-reported civic

engagement, as indicated by their inclination to help their peers in school and communities. The last objective is to discuss how the results of this study contribute to understandings about civic engagement in the school context.

Definition of Terms

Controversial issues: Controversial issues refer to complex and socially relevant issues (e.g. gun control laws and stem cell research) that generate high levels of disagreement (Dawson & Venville, 2009). Controversial issues, as defined in the educational context, have the following characteristics: (1) no definitive solutions; (2) tend to be current issues; and (3) disagreement usually stems from group differences (religious, cultural, gender) (Lynch & McKenna, 1990; Oulton, Dillon, & Grace, 2004)

Issues-centered curricula: Commonly used in social studies classes for students at the secondary level, these add-ons programs are designed to improve students' exposure to controversial issues (Evans & Saxe, 1996). Classroom activities including debate, mock voting, legislative procedures, and role-play are used as civic learning opportunities to support learning of controversial issues (Feldman et al., 2007; Kahne et al., 2006; Syvertsen et al., 2009).

Civic engagement: Civic engagement refers to collective action designed to identify and address issues of public concern (Adler & Goggin, 2005). For instance, a person can be civically engaged in the community by helping a neighbor or more broadly in the political arena by joining public demonstrations. Adolescents may not be formally eligible to participate in certain political activities, such as voting in the national elections; thus, researchers must consider assessing comparable activities shown to improve political participation during adulthood. Several examples of these activities include: volunteering for youth groups (e.g. Boy/Girls scout,

church and sports), participating in student government, and having political discussions with peers (Hoffman & Thomson, 2009; McFarland & Thomas, 2006; Smith, Faris, Denton & Regerus, 2002).

CHAPTER 1: LITERATURE REVIEW

This chapter provides an overview of the theoretical framework followed by a review of relevant research used to explain why issues-centered curricula similar to the Word Generation program can help improve adolescents' civic engagement. Although the study is specifically focused on adolescents in regards to civic engagement, studies connected to adults are also included in this chapter to allow for a more thorough consideration of this topic. The scope of this literature review is quite broad and considers research from political, education, communications, and developmental psychology fields.

The Communication Mediation Model guides understanding of how issues-centered curricula can improve civic engagement through interpersonal discussions of controversial issues. Following presentation of this theoretical framework is a section that highlights how teachers and students experience issues-centered curricula at school. Next, I discuss the significance of civic engagement and how it is assessed in regards to youth. The following section is a summary of evaluations on various issues-centered curricula implemented in schools. The next section discusses how effectiveness of the Word Generation program may vary for students from ethnic/racial minority backgrounds. The chapter concludes with justification of using mediation analysis to consider how program effects may operate through classroom discussions.

PART 1: The Communication Mediation Model

This section is a short overview discussing each of the processes found in the Communication Mediation Model with a more thorough discussion in the following sections. The Communication Mediation Model serves as a useful framework for understanding how

learning about controversial issues can influence individuals to become active in their community (See Figure 2). The key process of engaging interpersonal discussions with peers may explain the relationship between students' learning about controversial issues and their civic engagement development. (Eveland, McLeod, & Horowitz, 1998; Fleming & Thorson, 2008; Scheufele, 2000).

According to Cho and his colleagues (2009), communication mediation model operates through three interrelated processes summarized as the O-S-R model: Orientation, Stimulus, and Response. The first process refers to *Orientation*, which considers how individuals may be situated in certain social settings characterized by heterogeneous (e.g. schools, workplace) or homogenous (e.g. church) orientations that support varying levels of ideological diversity (Huckfeldt, 1995). Heterogeneous orientations are composed of *non*-likeminded individuals, which support exposure to more conflicting and diverse beliefs than homogenous orientations (Scheufele, Hardy, Brossard, Waismel-Manor, & Nisbet, 2006). Next, *Stimulus* refers to the communication context in which interpersonal discussion is supported. For example, discussions of controversial issues may occur through a number of formats including: online communications, campaign ads, and face-to-face discussions (de Vreese & Boomgaarden, 2006). Last, *Response* is related to a cognitive or behavioral response that results from exposure to the Stimulus and Orientation process. The individual may respond with increased factual knowledge and/or participatory action to resolve a particular issue (Woo & Kim, 2009). The next section discusses each these process and how they inform the research questions posed in this study.

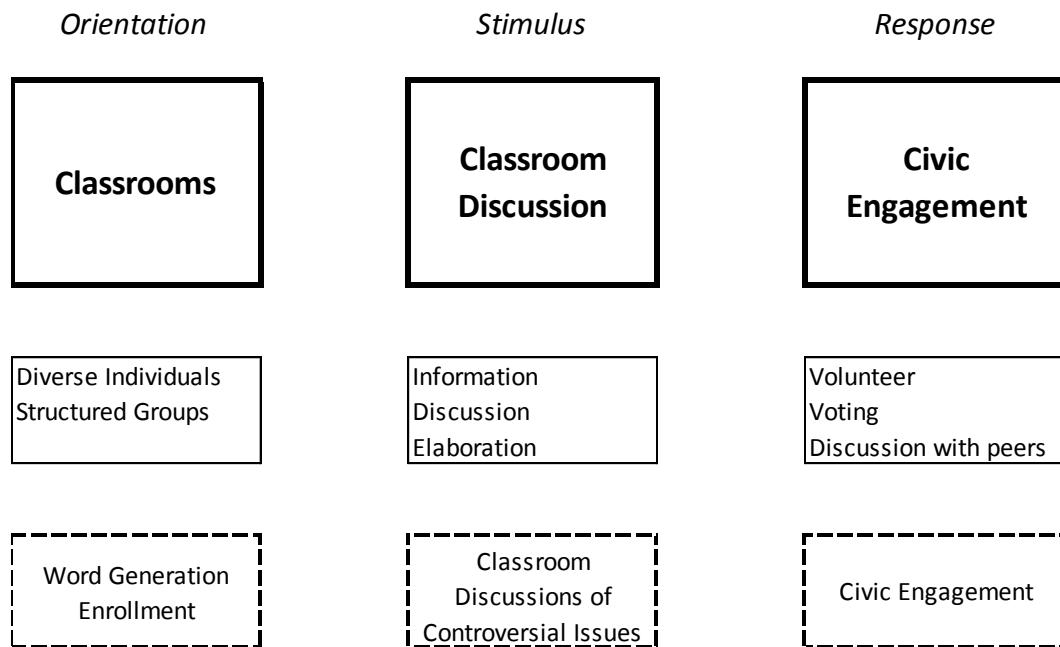


Figure 2. *Communication Mediation Model*

Adapted from Scheufele, Hardy, Brossard, Waismel-Manor, & Nisbet, 2006.

A. Orientation: Exposure to Diverse Beliefs

Social settings, such as the workplace, home, and religious organization have varying degrees of orientation (Conover, Searing, & Crewe, 2002; Scheufele, 2000). These social settings may be classified as having homogenous or heterogeneous orientations depending on the ideological diversity or range of beliefs presented (Mutz, 2002). Political, religious, and cultural beliefs, for example, may contribute to the setting’s ideological diversity (Mutz, 2002). Homogenous orientations have less support for ideological diversity than heterogeneous orientations (Huckfeldt, Levine, Morgan, & Sprague, 1998). For example, religious organizations are less likely to attract individuals who are dissimilar in beliefs and values (Huckfeldt, 1995). In this setting, the individual is not only exposed to a limited range of beliefs and perspectives, but also have less opportunities to debate ideas that challenge group norms

(Scheufele et al., 2006). In contrast, certain settings such as the workplace are generally characterized as having heterogeneous orientations. Individuals are brought into close proximity and interactions with others from different backgrounds and beliefs (Mutz, 2002). The next section examines how schools support increasing ideological diversity because of its diverse student population, which is critical to exposing students to rich and active discussions of controversial issues.

According to Hess (2004), schools and classrooms have more ideological diversity than in many other contexts including “family, church, synagogue, mosque or clubs” (p.257). Further, Conover and his colleagues (2002) argue that most public schools have a democratic nature similar to town hall meetings, where access is generally open to all citizens. Interviews with middle and high school students revealed that they were more accustomed to being exposed to more diverse views at school than in any other social setting, including the neighborhood (Hess & Ganzler, 2007). Conover and his colleagues (2002) not only attributed this phenomenon to the multicultural makeup of the school, but also explained that teachers play a role in highlighting differences of opinions among students.

Schools with more ideological diversity have the potential of supporting more active and engaging classroom discussions. For example, one recent study ($N = 4,483$) examined whether the ideological diversity of American high schools as measured by ethnic/racial diversity¹ was related to students’ perceptions of classroom climate (Kawashima-Ginsberg & Levine, 2014). Students were asked to rate how well they experienced discussions of controversial issues in their social studies or civics classes. The study used multilevel modeling that controlled for a

¹ Racial makeup of the school was used as a proxy to measure the school’s ideological diversity. Three categories were developed: (1) majority – participants’ race matched the predominant racial group in the school; (2) minority – participants’ race differed from the predominant racial group in the school and (3) racially pluralistic group – regardless of the participant’s race, no predominant group in the school.

number of covariates related to students' family and social backgrounds in the analysis. Compared with schools having less ideological diversity (majority and minority racial groups), attending schools with high ideological diversity (racially pluralistic schools) was a stronger predictor of students' perceptions of classroom climate. Results from the study suggest that schools with higher ideological diversity (as indicated by more racial groups) is more likely to support active and engaging discussions of controversial issues. Although the study provides insights on the relationship between attending ideologically diverse schools and students' perception of classroom climate, the study is limited to understanding the degree that controversial issues were used in classrooms because no comparison groups were used in the analysis. Despite this limitation, there is evidence that schools support a certain level of ideological diversity that matters in terms of exposing students to diverse beliefs.

B. Stimulation: Controversial issues as a basis for discussion

Classroom discourse in schools tends to be one-sided and proceeds in a predictable pattern of teacher question, student response, and teacher evaluation (Initiation, Response, Evaluation or IRE) (Cazden, 1988; Mehan, 1979). A study on classroom discourse conducted in nine high schools found that more than 60% of social studies classes were observed to support few instances of daily discussions, while recitation was evident in a majority of the classrooms (Nystrand, Gamoran, & Carbonaro, 1998). The National Council for the Social Studies (NCCS), the largest association in social studies teaching, published a report that emphasized the need to instruct students on controversial issues (NCSS, 2007). Discussions of these social problems in the classroom context may be beneficial to students because of several key processes: learning about the issue, modeling discourse behavior, weighing different perspectives, and assessing validity of claims (Oulton, Dillon, & Grace, 2004). This section discusses how using

controversial issues in the classroom can provide students with discussion opportunities that can increase interest and learning.

Teachers who are given support to facilitate discussions of controversial issues can boost students' level of engagement that includes knowledge (Hess & Posselt, 2002) and reasoning quality (Venville & Dawson, 2010). More important, the author (Lin, Lawrence, & Snow, *under review*) conducted an evaluation of the WG program using students sampled in this current study to explore possible treatment effects on students' communicative self-efficacy.

One case study (Hess & Posselt, 2002) examined tenth grade students who enrolled in a social studies class ($N = 46$) that emphasized learning controversial issues. Results of the study showed that students improved on their interest, participation and knowledge of controversial topics. Since no comparison groups were included in the study, it is possible that students' growth was developmental with little connection to the intervention. In another study (Venville and Dawson, 1999) examined a 10-week intervention² designed to improve students' argumentation skills by engaging in classroom debates on the moral dilemmas associated with genetic engineering. In the context of the quasi-experimental study, 10th grade students participated in treatment ($n = 46$) and control ($n = 46$) conditions. At baseline, students in both groups were comparable on pre-test writing assessments of their argumentation skills. The authors found that treatment was associated with a medium effect size ($r = 0.30$) on students' argumentation quality and reasoning skill in their post-test writing assessments.

Based on the students sampled in this current study, the author (Lin et al., *under review*) examined the extent to which the WG program can improve students' *communicative self-efficacy* or confidence to communicate one's opinions about controversial issues in a public

setting. Students completed survey items assessing their communicative self-efficacy on a battery of fifteen controversial topics³. Paired sample *t*-tests indicate that treatment students reported higher communicative self-efficacy than control students on a set of topics immediately covered prior to testing (effect size of 0.13) but not on the set of topics covered in the previous year. The results of the study suggest that WG program provides students with opportunities to debate a wide range of controversial issues, which helps them understand the argumentative structure behind discourse practice (Felton, 2004; Kuhn & Udell, 2007). Taking these findings together, it is evident that students may benefit in several ways as a result of being exposed to classroom discussions of controversial issues. Although the benefits of learning controversial issues may appear to be sound in theory, it is important to consider teachers' perspectives in teaching these issues.

One study assessed the extent to which 76 high school studies teachers in non-urban communities were willing to teach controversial issues (Byford, Lennon, & Russell, 2009). 73% of the teachers were in strong agreement on their support for teaching controversial issues. However, the percentage of teachers that supported controversial issues fell to 60% if asked to instruct controversial issues specific to their schools' community. This trend was particularly striking among teachers with three or fewer years of teaching experience. The implication of this study suggests that job security and support from school district can influence social studies teachers' willingness to instruct controversial issues. The study, however, is limited to examining the perspective of social studies teachers with no information about teachers who instruct other

² The argumentation course was taught by an experienced Biology teacher who participated in a professional learning session specifically on argumentation (Dawson & Venville, 1999). The comparison class was taught by experienced Biology teachers who did not participate in the argumentation course. All courses (treatment and control) were given the same workbooks.

³ Students were asked to respond to the guiding question, "How confident are you in being able to participate in a discussion about the following topics?" and then assessed on a series of 15 topics. Eleven survey items were based on the topics that were covered in the WG program. The other four items also assessed topics of national interest to youth (Kettering Foundation, 2011) that were not covered in the WG program.

content areas. Also, not much is known about how teachers' belief/values were connected to their *actual* practice of teaching controversial issues.

Teachers may be hesitant and/or unskilled in facilitating discussions of controversial issues with students (Campbell, 2007; Cotton, 2006; Washington & Humphries, 2012). One concern is that teachers may be hesitant to raise disagreement among students, especially “contentious issues that could trigger conflict among students and perhaps raise the ire of administrators and/or parents” (Campbell, 2007, p.61). Washington and Humphries (2012) conducted case studies on social studies teachers' experiences of instructing students on controversial issues. The study found that teachers were hesitant to facilitate discussions about certain topics related to prejudice (e.g. gender, race, culture) as a result of having limited professional development from the school. Although these studies provide insights on teachers' experiences, these findings have limited generalizability because these studies did not include groups that could be used for comparative purposes. In consideration of these findings, teachers generally value teaching controversial issues in the classroom. However, teachers may adjust their instructions according to the level of support from the school and topics given to instruct. The next section discusses how students experience learning controversial issues at school.

Students may be drawn to classroom activities designed around controversial issues. Classmates and teachers within the classroom may provide a peer effect that “pulls” apolitical or politically disinterested teens into engaging discussions of political issues. In a study of high school students ($N= 2,811$) enrolled in 124 public and private American schools, Campbell (2008) used multilevel modeling that accounts for nesting at the classroom level and found that an aggregate measure of students' perceptions of classroom openness significantly predicted their understandings of political issues. The author (Campbell, 2008) observed that the collective

influence of students and teachers was critical to developing *collective efficacy*, which refers to individuals “acting coordinatively on a shared belief” (Bandura, 2000, p. 76). Put another way, youth may be influenced to talk based on the group effort of working towards a common solution (Browning, Dietz, & Feinberg 2004). Although controversial issues have the potential of highlighting divisions in peoples’ beliefs and values, youth may be drawn more to the process of working with their peers to reach consensus on issues (Velasquez & LaRose, 2014).

Conversely, students from particular demographic backgrounds may be shy or less inclined to participate in classroom discussions of controversial issues (Campbell, 2007; Lin & Salwen, 1997; Mutz, 2002). For example, Campbell (2007) examined the possibility of a *racial solidarity effect* that may impede students from discussing controversial issues with classmates having different ethnic/racial identities. Based on survey data from American ninth graders ($n = 1,408$) in 106 social studies classrooms, Campbell (2007) compared White and African American students’ perceptions of classroom climate (six-item index measuring teacher and peer support for discussions of controversial issues) based on whether they were enrolled in homogenous (either a majority White or African American student population) and heterogeneous (relatively equal mix of White and African American student population) classrooms. On average, African Americans students perceived less engaging classroom climates in homogenous classrooms (majority African-American student population) than in heterogeneous classrooms. The results of the study suggest that the racial solidarity effect is likely to occur in heterogeneous classrooms (three or more ethnic/racial groups represent at least 15%) in comparison with homogenous classrooms. The current study examines middle schools from an urban school district with a higher enrollment of Asian (54%) and Hispanic (19.9%) students than White (8.8%) students. Despite the overwhelming number of ethnic minorities enrolled in the school district, less than

20% of classrooms are expected to have a homogenous composure of students from the same ethnic/racial backgrounds (See Table 17 in the Appendix section). Given these considerations, the study anticipates a less than likely chance that a racial solidarity effect will limit students from freely engaging in classroom discussions of controversial issues.

The WG program improves classroom discussion quality among teachers and students. Lawrence and his colleagues (*under review*) evaluated the WG program in the context of a randomized trial that was implemented in urban school districts located in two different states in the Northeast (13 control and 15 treatment schools). In 168 observations conducted in content-area classrooms across treatment ($n = 80$) and control schools ($n = 88$), observers gave significantly higher classroom discussion quality rating on classrooms using the WG program than those in the control schools⁴. The current study seeks to assess if this observed trend is evident in the randomized trial implemented in an urban school district located in the West Coast state. The first two research questions consists of comparing classroom discussion quality between classrooms that used the WG program and those that did not.

- *Research Question 1a: Did classrooms in WG schools have higher ratings on discussion quality than those that did not use the WG?*
- *Research Question 1b: How did students perceive their own interest and efforts to engage discussions of controversial issues? How did students rate classmates and teachers' effort to engage in discussions of controversial issues?*

⁴ Lawrence and his colleagues (*under review*) compared classroom discussion quality in schools that participated in a randomized study of the WG program. Observers attended training sessions that instructed on using standardized codes for teacher and conversational moves. Up to three observers were assigned to rate classrooms in treatment and control schools. Participating teachers were randomized and a schedule was created identifying specific observation periods to be conducted on a given day. The discussion quality rating was developed to account for several measures including: the number of students participating, frequency of teacher initiating open-ended question, and students' intellectual contributions

C. Response: Civic Engagement

The author (Lin, 2013) published a review documenting the last 25 years of research on civic education programs and highlighted four issues-centered curricula – CityWorks, Kids Vote, Project Citizen and Student Voices – that have been tested in various research contexts. Table 1 is a comparison of program features and characteristic in each of the issues-centered curricula. Classroom discussions of various controversial topics are usually encouraged as part of the curriculum. Depending on the program, these discussions may be enhanced by certain features such as a mock legislation or role-play. With the exception of City Works, these programs are six to ten week lessons that may be timed to coincide with national election seasons (Kids Vote and Student Voices). The WG program is designed to be used for a 24-week period over the academic school year (average of 60-75 minutes/week). City Works, Project Citizens, and Student Voices are designed primarily for high school social studies courses (e.g. Civics and Government). In contrast, the WG program supports interdisciplinary teams that also include social studies teachers to instruct students on controversial issues.

This section discusses past evaluations of these issues-centered curricula with attention to the research context and findings. An overview of these studies is presented in Table 2. Generally positive findings have been found on quasi-experimental evaluations of the City Works and Kids Vote programs (Hartry & Porter, 2004; Kahne et al., 2006). For example, CityWorks program – a standards-based curriculum for high school students emphasizing daily simulation of government activities – reveal significant program effects (*Cohen's d* = 0.27) on high school students' commitment ($n = 154$) to engaging in political activities (Kahne et al., 2006). In another program called Kids Vote, teachers facilitate a number of participatory activities that include: dissecting political advertisements, analyzing rival positions and, coordinating debates about

campaign issues (McDevitt & Chaffee, 2000; McDevitt & Kiouisis, 2006; Saphir & Chaffee, 2002). Based on interview data collected from 457 student-parent pairs who participated in a quasi-experimental trial (with no control group) of the Kids Vote program, McDevitt and Chaffee (2000) found that program enrollment predicted students' self-reported inclination to engage in discussion of political issues at home. Saphir and Chaffee (2002) conducted a longitudinal analysis of the sampled students ($n = 313$) and found that program enrollment strongly predicted parents' self-reported political discussions six months later.

Compared to evaluations of the other issues-centered curricula (i.e. Cityworks, Kids Vote and Project Citizen), evaluations on the Student Voices program are highlighted by its quasi-experimental design (with comparison groups) that involves multiple research sites (Feldman et al., 2007; Pasek et al., 2008; Syvertsen et al., 2009). Generally timed to coincide with national election periods, the Student Voices (SV) program provides high school students with unique opportunities to participate in mock debates, simulated congressional hearings and communicate with political campaigns through the SV website (Syvertsen et al., 2009). One study (Syvertsen et al., 2009) examined the effects of the SV program on high school students who enrolled in social studies classrooms that participated in treatment ($n = 48$) and control conditions ($n = 32$). Treatment ($n = 776$) and control ($n = 894$) students completed pre and post-test surveys on how often they engaged in community volunteering to measure civic engagement, as well as their voting interest in the November election. Based on regression models that controlled for students' grade level, race, socioeconomic status, and political interest, the SV program was found to have a 0.03 and 0.21 effect size on students' self-reported civic engagement and voting interest, respectively. These results suggest that exposure to issues-centered curricula can improve students' self-reported civic engagement and voting interest.

Another quasi-experimental evaluation on the SV program was conducted in the context of 26 public high schools located in a large urban school district with a racially diverse population consisting mainly of African-American (40%) high school students (Feldman et al., 2007). Treatment ($n = 776$) and control ($n = 894$) students completed pre and post-test surveys on how often they research and discuss controversial issues with their peers, as well as their voting interest in the national election. Based on multilevel models that controlled for students' grade level, ethnic/racial identity, gender, maternal education, and political interest, the SV program was found to have a 0.17 effect size on students' voting interest.

Although these evaluation provide evidence that issues-centered curricula can improve civic engagement among youth, there are several limitations worth noting. The three evaluation studies on the SV program were conducted in the context of a quasi-experimental design (Feldman et al., 2007; Pasek et al., 2008; Syvertsen et al., 2009), which opens the possibility that teachers implementing the SV program were already inclined and/or experienced to use the program, than those in the control group. More enthusiastic teachers may have “helped to produce the observed outcomes” (Feldman et al., 2007, *p.*96). These evaluation studies were also conducted on students mainly from European American (Syvertsen et al., 2009) and African-American (Feldman et al., 2007) backgrounds. More research is needed to understand how Asian and Hispanic students respond to issues-centered curricula.

Table 1. Description and Program Features of Issues-Centered Curricula

Program	Descriptions					Program Features				Implementation and Costs	
	Grade Level	Course content	Timing	Scope of Issues	Frequency	Mock Legislative Process	Discussion / Debate	Voting	Internet / Media Access	Difficulty of Implementation	Costs
City Works ¹	High school	Social studies	Year-round	Local	10 minutes per class period	High. Citizens of a fictitious city called Central Heights, acting as lobbyists and local politicians	Medium. Students debate on issues before conducting vote	Low. Students engage in decision-making regarding policy issues.	None.	Low. Curriculum material with suggested teacher and student activities. No provision of teacher professional development	Low. Curriculum material \$200 of class set (teacher & student manual)
Kids Vote ²	Middle and high school	Social studies	Only during national election seasons	National and state	4 to 6 hours per week	None.	High. Multi-pronged approach through experiential learning that relies on group-problem solving, peer discussion, and cooperative activities.	High. Students are given the opportunity to register in class as a Kids Voting voter, and they are supposed to present their voter registration card at the precinct before they can vote	High. Students have to deconstruct campaign ads and prepare for classroom debates	Low. Participating schools agree to invest a minimum of 4 to 6 hours of instructional time teaching the Kids Voting Curriculum in the weeks leading up to an election.	High. Curriculum and teacher training \$13,000-15,000 per school
Project Citizens ³	Middle and high school	Social studies	6 weeks	Local	50 minutes per class period	High. Culminating activity is a simulated congressional hearing where students testify before a panel of judges	High. Students engage in organized debates and student discussion in small groups	None.	None.	Low. Curriculum material and optional teacher professional development	Low. Curriculum material \$400-600. No teacher professional development.
Student Voices ⁴	High school	Social studies	10 weeks during national election seasons	National and state	2 hours per week	High. Simulation of procedures and legislative process	High. Students have discussion of current events. Also teachers are encouraged to invite elected officials and policymakers	High. Not only includes voting procedure in the classroom, students participate in voting registration drives and voter education initiatives.	High. Computer terminals with Internet access provided in classrooms.	High. 10 week as a one-semester supplement to existing civic education curricula. Teachers receive 10 hours of instructions in the SV curriculum. However must provide computer terminal with Internet access	High. Although cost of curriculum and teacher professional development is not known, a significant amount is devoted to media and technology in particular to computer terminals.
Word Generation ⁵	Middle school	ELA, Science, Math, and Social studies	All year round	Global	15 minutes daily, 60-75 per week	None.	High. Social studies teachers generally required to facilitate classroom discussion	None.	None.	Low. Curriculum material and optional teacher professional development	Low. Freely available online. \$400 for 2-day institute for teachers

Note. ¹ Sources based on Constitutional Rights Foundation (2012), Kahne, Chi & Middaugh (2002), Kahne, Chi & Middaugh (2006) and Vontz, Metcalf & Patrick (2000); ² Sources based on Corporation for National Community Service (2003), Kiouisis, McDevitt & Wu (2005) and McDevitt & Kiouisis (2006); ³ Sources based on RMC Research Corporation (2008); ⁴ Sources based on Bennett, Simon & Xenos (2002) and Feldman, Pasek, Romer & Jamieson (2007). ⁵ Sources based on Snow, Lawrence, & White (2009).

Table 2. Review of Studies on Issues-Centered Curricula

Authors	Year	Program	Design	<i>n</i> Treatment	<i>n</i> Control	<i>N</i> Total	Grade level	School	Racial Makeup	Gender	Analysis Procedure	Outcomes	Covariates	Results
Pasek, Feldman, Romer, & Jameson	2008	Student Voices	Quasi-experimental	776	894	1782	High school	26 public charter schools in urban school district	40% Black, 10% Hispanic, 10% Asian	Male (52%) Female (48%)	Structural Equation Modeling	Voting Interest, Civic knowledge	Political interest, efficacy	Students who experienced two semesters of the program experienced improvements on self-reported civic engagement
Feldman, Pasek, Romer & Jameson	2007	Student Voices	Quasi-experimental	603	252	865	High school	22 public charter schools in urban school district	34% Black, 27% white, 17% Asian, 10% Latino	Male (47%) Female (53%)	Multilevel regression	Civic knowledge, follow and discuss politics	Ethnicity/race, maternal education, grade level, gender, political interest	Positive impacts of the SV curriculum. Strongest among these was the effect of classroom political discussion. Talking about political issues appear to motivate interest in politics, bolster efficacy, and contribute to knowledge
Syverson, Stout, Flanagan, Mira, Oliver, & Sundar	2009	Student Voices	Quasi-experimental	776	894	1670	High school	80 classrooms in two urban school districts	92% White, 6% Black, 3% Hispanic	Male (52%) Female (48%)	Clustered regression models	Volunteering in the community, voting interest, engagement in electoral politics and civic knowledge	Political interest, grade level, maternal education	Significant impact on engagement as measured by volunteering and electoral politics, as well as voting interest in November.
McDevitt & Chaffee	2000	Kids Vote	Quasi-experimental (but no CO group)	457	N/A	457	5th-12th	1 classroom	N/A	N/A	Multilevel regression	Civic engagement as indicated by engaging political discussion with peers and family	Political interest, efficacy	In comparing students in treatment and control conditions, effect sizes was estimated in the range of 0.08 to 0.14 for various measures of civic engagement
Harry & Porter	2004	We the People	Quasi-experimental	257	160	417	High school	33 classrooms	N/A	Male (47%) Female (53%)	Linear Regression	Civic engagement as indicated by volunteering and involvement in school activities	Political interest and civic participation	In comparing students in treatment and control conditions, effect sizes was estimated to be 0.15 for students' engagement in civic activities
Kahne, Chi & Middaugh	2006	CityWorks	Quasi-experimental	154	77	231	High school	5 high schools in urban school district	N/A	N/A	Multivariate linear regression (no controls)	Personally responsible, participatory, justice-oriented	Personally responsible, participatory, justice-oriented	Pre and posttest data reveal positive and statistically significant effects on self-perceived skills of voting and participation in civic groups

PART II: Evaluating Civic Engagement

This section discusses how civic engagement is measured in the context of issues-centered curricula. The first section discusses how civic engagement is defined and measured when researching the experiences of early adolescents (aged 11 – 14 years old). Next is a discussion on certain individual and family characteristics that may shape students' civic engagement. Following this is a discussion on how Asian and Hispanic youth respond to issues-centered curricula. The last section discusses how mediation analysis can be useful in measuring the extent that classroom discussion may explain observed effects on students' civic engagement.

A. Significance and Measurement of Civic Engagement Among Adolescents

This section discusses how civic engagement measures and voting interest are defined and assessed as it pertains to adolescents. Civic engagement is a broad indicator of how individuals engage in collective action to solve community problems (Adler & Googin, 2005). Based on a telephone survey of 3,246 Americans aged 15 to 55+, a 2001 report called the *Civic and Political Health of the Nation* indicates that Americans in varying age groups participate in different types of civic engagement activities (Keeter, Zukin, Andolina, & Jenkins, 2002). Figure 3 represents a civic engagement model based on a continuum that ranges from individual/private to formal/public collective action that occur within multiple context: peer/family, school, community, and electoral (Adler & Googin, 2005; Chi, Jastrzab, & Melchior, 2006; Flanagan, Syvertsen, & Stout, 2007). This model is useful in showing how participation in the peer and school context may influence civic engagement in the electoral context.

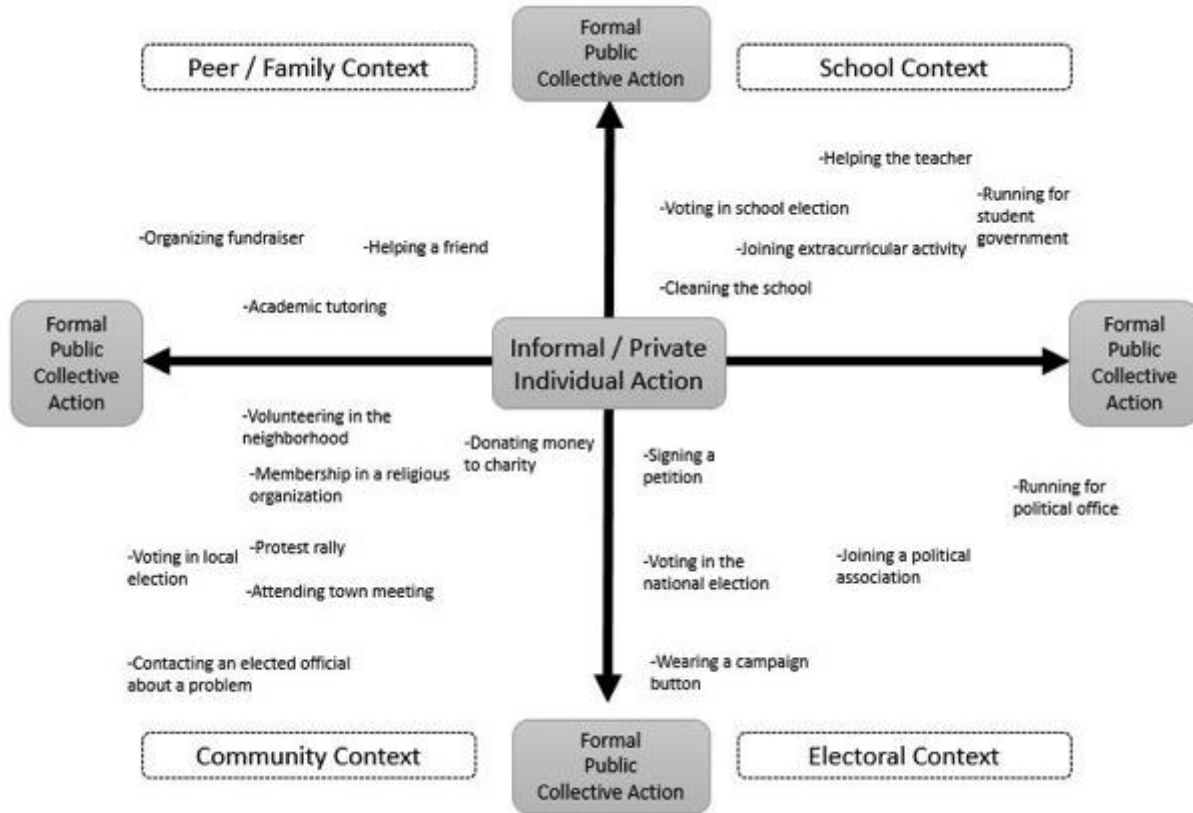


Figure 3. *Civic engagement continuum model*

Adapted from Adler and Googin, 2005; Flanagan, Syvertsen, & Stout, 2007 and Chi, Jastrzab, & Melchior, 2006.

In past studies that examine the civic engagement of adults (aged 21-35 years), political scientists usually focus on studying the electoral aspects of civic engagement, which includes: voting during the national election, donating money to political campaigns, signing a petition, and protesting in rallies (Levine & Lopez, 2002). Depending on early or late adolescence, youth are usually asked to assess their participation in civic activities in the school, community, and electoral context (Adler & Goggin, 2005). For example, late adolescents (aged 14-18 years old) are generally asked to rate how often they participate in civic engagement activities in the community and electoral context that include: volunteering, donating money to charity, and communicating with elected officials (Andolina, Keeter, Zukin, & Jenkins, 2003; Kahne et al., 2006; Syvertsen et al., 2009). Studies on early adolescents (aged 11 – 14 years old) tend to assess

more broadly defined indicators based on willingness to help individuals within their personal, school, and community networks (Flanagan, Syvertsen, & Stout, 2007; Torney-Purta, Barber, & Wilkenfeld, 2007). This study considers youth's inclination to help peers in their school and community context.

This study shares similar concerns with past evaluations on issues-centered curricula that also consider students' voting *interest* or *intentions* during the national elections (Syvertsen et al., 2009). It is possible that adolescents interested in voting may not *actually* vote when they become eligible voters (Visser, 1994). To address this concern, Hooghe and Wilkenfeld (2008) conducted a correlation study that compared the stability of voting interest and voting behavior on youth ($N = 2,800$) at three different time points – (Time 1) Age 14, (Time 2) Age 18, and (Time 3) Age 18-30. The authors found that intended voting behavior at Time 1 (14 years old) was highly correlated ($r = 0.89, p < 0.01$) with actual voting behavior at Time 2 (18 years old), but did not correlate with Time 3 (18-30 years old). The results of the study suggest that voting behaviors are quite stable across early adolescence and at the time of voting eligibility (18 years), but not necessarily beyond reaching 18 years. Although the Hooghe and Wilkenfeld study (2008) was conducted in the context of youth from eight European countries, a study on American youth ($N = 5,092$) suggests that the relationship between voting interest and voting behavior were quite stable depended on the extent to which the individual had strong ($r = 0.67, p < 0.05$) or weak ($r = 0.36, p < 0.04$) ties to a political party (Granberg & Holmberg, 1990). Taking these findings together, this study highlights the importance of assessing adolescents' voting interest, which can serve as a modest indicator of their actual voting behavior.

- *Research Question 2a: Did participating in the WG program have a positive impact on students' self-reported civic engagement and voting interest?*

B. Demographic and Political Covariates that Influence Civic Engagement

This section provides justification on why certain student characteristics need to be considered in evaluating the Word Generation program. Although each study differs to the extent that certain covariates are defined, most of the studies share similar methodological concerns in considering family, neighborhood and school factors that influence civic engagement (Kahne et al., 2006; Root et al., 2007; Syvertsen et al., 2009). The next section is a discussion of specific demographic and political characteristics that may influence adolescents' civic engagement.

Demographic characteristics. Certain demographic characteristics (e.g. gender, ethnic/racial identity, and socioeconomic status) may be associated with higher levels of civic engagement. In comparison with males, female adolescents are more inclined to volunteer in political and non-political activities (Rosenthal, Feiring, & Lewis, 1998). Further, Kuhn and others (1999) found that male and female 10th graders differed in their interest in reading about certain political topics. Females expressed more interest in public policy, such as peace and ecology; in contrast, males were more interested in “front page policies” related to news on foreign affairs and federal government.

Various studies report the importance of considering students' ethnic/racial and socioeconomic backgrounds, which can strongly shape their civic engagement (Campbell, 2007; Feldman et al., 2007; Syversten et al., 2009). According to Uslaner and Conley (2003) adolescents from ethnic/racial minority backgrounds prefer to engage in civic activities that support members, issues, and causes related to their own nationalities, rather than the larger community. More details about the specific experiences of Asians and Hispanic youth are discussed in the next section. Further, there are mixed findings in terms of understanding how socioeconomic status (SES) is related to adolescents' civic engagement. Hart, Atkins and Ford

(1998) report that adolescents from lower family income backgrounds were less likely to volunteer in comparison with those from more upper income backgrounds. In contrast, Rosenthal and his colleagues (1998) found no differences in volunteering between those from lower and higher SES backgrounds. In sum, these findings support consideration that certain demographic characteristics can shape the degree to which youth may participate in civic activities.

C. Assessing Ethnic/Racial Minority Youth

This section reviews current understandings about how Hispanic and Asian youth may respond to issues-centered curricula in schools. Compared to youth from other ethnic/racial backgrounds, classroom supports for discussions of controversial issues is particularly important for Hispanic youth. One study (Torney-Purta, Barber, & Wilkenfeld, 2002) examined school and neighborhood factors that contribute to the civic engagement gap between Hispanic ($n= 380$) and non-Hispanic ninth graders ($n= 2,373$). Students completed a battery of civic engagement items that measured civic knowledge, voting interest, and attitudes. Multilevel models that controlled for students' immigration status and political interest provide evidence that Hispanic students lagged behind their counterparts in terms of civic knowledge and voting interest. However, the degree that Hispanic students perceived an open classroom climate to discuss controversial topics virtually closed the civic engagement gap with their non-Hispanic counterparts. This study seeks to understand whether Hispanic adolescents exposed to issues-centered curricula may experience additional gains on their civic engagement.

Issues-centered curricula interventions have been found to be quite effective for Asian youth. One study evaluated Taiwanese adolescents ($N = 1,108$) who participated in a quasi-experimental study of an issues-centered curriculum (i.e. Project Citizen) that was implemented in Taiwan high schools (Liou, 2003). Multilevel regression indicates that the curriculum had a

positive impact on students' political interest, but not quite for other civic engagement outcomes related to volunteering and protesting. Although the issues-centered curriculum was found to improve civic engagement, not much is known about how this finding applies to other Asian-based ethnicities including: Korean, Japanese, Chinese, and Southeast Indians. More comparative work is needed to understand how Asian students differ from non-Asian students in their participation in issues-centered curricula.

One evaluation focused on understanding whether issues-centered curricula have heterogeneous treatment effects for students from various ethnic/racial backgrounds. The quasi-experimental evaluation of the SV program (Feldman et al., 2007) was conducted within the context of a racially diverse student population (40% African-American and 10% Hispanic). In addition to examining the program's main effect, the multilevel models also included an interaction term consisting of treatment and belonging to a racial minority group (combination of African-American and Hispanic). The authors report that students who identified as an ethnic/racial minority did not gain additional benefits from the program. This analysis will consider estimating the extent that treatment effects differ among Asian, African American, and Hispanic students.

- *Research Question 2b: To what extent does students' ethnic identification (e.g. Latino, African American, and Asian) influence the direction and strength of the relationship between program participation and self-reported civic engagement?*

D. Mediation of Classroom Discussion

The final research question consists of understanding how the WG program's feature of classroom discussion may explain improvements in students' civic engagement. Past evaluations of issues-centered curricula focus primarily on understanding treatment effects on students' self-

reported civic engagement (Kahne et al., 2006; McDevitt & Chaffee, 2000). However, very little work has been conducted to understand the specific components of the program responsible for the observed effects. For example, the Kids Vote program is implemented in multiple ways, such as providing students with classroom debates and engaging in a mock voting activity. Knowing the specific components can provide practical information on the interventions' strength and weaknesses (MacKinnon et al., 2001).

One study on the Student Voices (SV) program analyzed specific mechanisms explaining program impacts on students' civic engagement (Feldman et al., 2007). After finding a main effect of the SV program, mediation analysis was used to identify certain program activities that contributed to the observed effect. In pre and post-surveys measuring civic engagement, students provided information on the extent to which they experienced three SV program-based activities – (1) candidate interaction, (2) classroom discussion, and (3) computer lab usage. Mediation analysis was conducted by comparing treatment effects between models that included and excluded these three measures on program activities. The SV program's main effect on students' self-reported civic engagement was no longer significant after controlling for the classroom discussion measure. The results of the study suggest that classroom discussion mediated the relationship between the SV program and students' self-reported civic engagement.

Although the study (Feldman et al., 1997) provides important insights on how program effects may be mediated by classroom discussion, the mediation analysis relied on students' perceptions on whether political discussion was active or not in their social studies classrooms. This measure fails to account for the *quality* of classroom discussion, which considers other factors, such as the amount of open-ended questions and substantive contributions posed by teachers and students (Hiebert & Wearne, 1993; Michaels, O'Connor, & Resnick, 2008). One

evaluation of the WG program (Lawrence et al., *under review*) found that treatment classrooms had more active and engaging discussion than control classrooms based on classroom observation data collected from trained observers who used standardized rubrics to measure discussion quality. Total effect of the WG program on a student-level measure of academic vocabulary scores was mediated (14%) through improved classroom discussion. In consideration of these findings, the current study also seeks to assess the extent to which treatment effects on students' civic engagement were mediated by classroom discussion.

This analysis does not suggest that classroom discussion as the only mechanism explaining how the WG program can influence students' civic engagement. The WG program supports instructions on controversial issues with other learning activities, such as essay writing, reading, math problems, and science experiments. The WG program also differs from other issues-centered curricula because of its emphasis on literacy development and not civic engagement. In turn, the WG program does not specifically require teachers to enhance classroom discussions with certain political activities, such as mock voting and role-play. Although reading and writing about controversial issues represents key elements to the WG program, the study specifically focuses on classroom discussions to understand whether it serves as a primary mechanism of improving students' civic engagement (Campbell, 2007; Syvertsen et al., 2007; Torney-Purta et al., 2007).

- *Research Question 3a: To what extent does the classroom discussion quality rating correlate with students' self-reported civic engagement? How do schools compare with each in other in terms of classroom discussion quality and self-reported civic engagement?*

- *Research Question 3b: To what extent did improved classroom discussion mediate the relationship between students' participation in the WG program and their self-reported civic engagement?*

CHAPTER 2: METHODS

Research Design

Under the leadership of Dr. Catherine Snow (Harvard University) and the Strategic Education Research Partnership (SERP), this study was conducted within the context of an ongoing randomized trial of the Word Generation program that was funded by the Institute of Education Science (IES) (#R305A090555). In the first section, I describe the work done at the site prior to my involvement in the study. The next section explains my involvement in evaluating students' civic engagement in the context of this randomized trial of the WG program.

Context of Randomized Trial

One urban school district located in the West Coast of the United States participated in a two-year evaluation study of the Word Generation (WG) program (Fall 2010- Spring 2012). SERP recruited leaders from the school district, who then invited their school leadership teams to participate in the study. School district leaders informed parents and students about the study. Students obtained parental consent to participate and release information on their academic and psychological performances for research purposes (See Figure 12 in Appendix). Teachers in the treatment conditions were required to implement the WG program; whereas, teachers in the control conditions did not use the WG program and participated in “business as usual” instructions (Lawrence et al., 2012).

In the beginning stages of the randomization process, state accountability data was used to rank schools on several school-level variables based on student enrollment and prior academic achievement. Other considerations include percentage of students identified as ethnic minorities, low-income status, and English language learners. Propensity score matching was used to create composite scores based on these school-level variables. The composite scores were then used to

determine each school's ranking. Each sequential pair of schools were assigned into dyads and the final process of randomization occurred within each dyad (See Table 18 in Appendix). As a result, seven schools were assigned to the treatment group and six schools into the control group. As confirmed by *t*-test analyses to test successful randomization, treatment and control schools were comparable across all school-level variables. Two treatment schools had the first and third highest student enrollment among all participating schools. Consequently, more students were assigned to treatment ($n = 4,907$, 53.9%) than control ($n = 4,182$, 46.0%) conditions.

Context of the Current Study on Students' Civic Engagement

Although the author was not involved with the research design and implementation of the WG program at the school sites, the author worked with members in the SERP to develop the evaluation study on students' civic engagement. In the last year of the study, six control and six treatment schools participated in the final phase of data collection that also included this current study on civic engagement. Several schools experienced changed leadership or circumstances, which may have had an adverse effect on their participation in the study⁵. For these reasons, there were challenges in getting full participation from teachers and students to participate in data collection⁶.

Program implementation. Preliminary analysis indicates a consistently high level of implementation during specific times that observers were present; however, students' completion rates of workbooks varied and tended to decrease precipitously towards the end of the year. Observers found that teachers implemented the Day 1 program activities in a "smooth and efficient" manner in 83% of the 96 observed class periods (See Table 3). Further, observers rated

⁵ One treatment school (Jasmine) participated in the first year but did not participate in data collection of students' academic and civic engagement scores; thus, the school was not included in the current study.

⁶ The contribution rate of test scores varied across schools from very low (Hemlock, 27%) to quite high (Apple, 90.7%).

how often they saw teachers and students bring WG workbooks into the classrooms, which contain all the essential information related to each week’s lesson including lesson activities, word list, and passages. In 89% of the observation periods, observers found that teachers brought their workbooks to class. Similarly, 89% of the observation periods report that all students in the classrooms had their workbooks. Further analyses of these 16 observations indicate that between seven to twenty students did not bring their workbooks.

As part of the evaluation, we requested workbooks from at least a quarter of the students enrolled in treatment school (See Table 21 and Figure 8 in Appendix). Although one school achieved this goal (Arbola), the rest of the schools contributed 6.2 to 21.7% workbooks. Students’ workbook completion rate varied among schools from 44.4 to 89.9%. Further, workbook completion rate decreased over time from the start in Week 1 (82%), midpoint at Week 12 (69%), and at the end in Week 24 (57%). These preliminary analyses suggest that program implementation was quite consistent in the beginning, but may be noticeably inconsistent throughout the school year.

Table 3. Fidelity of WG Program Based on Workbook and Observation Data

School	Workbook Data			Observation Data							
	No. workbooks collected	% Students completed	Contributions/ Enrollment	(1) Day 1 activities launched in a smooth and efficient manner		(2) All Teacher had workbooks		(3) All Student had workbooks		(4) If all students did NOT have their WG workbooks, how many did not (if more than 5 students)	
	<i>N</i>	<i>M</i>	<i>M</i>	<i>n</i>	<i>M</i>	<i>n</i>	<i>M</i>	<i>n</i>	<i>M</i>	<i>n</i>	<i>M</i>
APPLE	73	89.9%	6.2%	14	0.93	10	0.90	11	1.00	1	16.00
ARBOLA	258	62.8%	25.0%	15	0.87	12	0.92	12	1.00	3	19.30
FLOWER SQUARE	110	44.4%	19.3%	17	0.59	13	0.77	11	0.55	4	15.76
HEMLOCK	44	82.4%	13.4%	17	0.94	13	0.92	13	1.00	3	19.40
MOON	101	52.4%	18.6%	16	0.69	12	0.83	10	0.80	3	12.30
PALM	254	77.9%	21.7%	17	1.00	12	1.00	12	0.92	2	16.50
TOTAL	840	68.3%	17.37%	96	0.83	72	0.89	69	0.89	16	16.53

Note. Coded 1 or 0 based on completion of the math, word chart, science, or persuasive writing sections of the workbooks

Sample

Table 4. Grade Level Contributions by Treatment Conditions (Analytic Sample)

Schools	6th Graders		7th Graders		8th Graders		All Grades	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>N</i>	%
Control Schools								
Duffie Oak	154	8.2%	62	3.3%	136	6.7%	352	6.1%
Evergreen	56	3.0%	20	1.1%	35	1.7%	111	1.9%
Honeysuckle	81	4.3%	124	6.6%	230	11.3%	436	7.5%
Maple	244	13.1%	205	10.9%	216	10.6%	667	11.5%
Rosemary	49	2.6%	202	10.8%	187	9.2%	438	7.6%
Vineland	97	5.2%	87	4.6%	110	5.4%	294	5.1%
Total	681	36.5%	700	37.3%	914	44.8%	2,298	39.7%
WG Schools								
Apple	362	19.4%	352	18.8%	337	16.5%	1,052	18.2%
Arbola	269	14.4%	239	12.7%	248	12.2%	756	13.1%
Flower Square	113	6.1%	71	3.8%	96	4.7%	280	4.8%
Hemlock	60	3.2%	58	3.1%	45	2.2%	163	2.8%
Moon	98	5.2%	134	7.1%	123	6.0%	355	6.1%
Palm	284	15.2%	322	17.2%	276	13.5%	882	15.2%
Total	1,186	63.5%	1,176	62.7%	1,125	55.2%	3,488	60.3%
All Schools	1,867	32.2%	1,876	32.4%	2,039	35.2%	5,786	100.0%

Note. Pseudonyms were used to protect the schools' identity.

Although the study analyzes an equal number of schools that were randomly assigned to treatment and control conditions, the sample contains more treatment students ($n = 3,488$, 60.3%) than control ($n = 2,298$, 39.7%) students (See Table 4). Student enrollment in the treatment schools increased by 3.1% and student enrollment in the control schools decreased by 3.9% since the first year that schools participated in the study. Further, students' contribution of civic engagement was noticeably higher in treatment (89.7%) than control (76.8%) schools (See Table 19 in Appendix). For these reasons, there are considerably more treatment and control students in the analytic sample.

Table 5 indicates that the sample analyzed in this study has slightly more females (52.3%) than males (47.7%). Nearly two-thirds of the participants were from low-income background (63.9%), as indicated by their eligibility in the Free and Reduced Lunch program (FRL). A substantial number of students come from extremely diverse racial/ethnic background: Asian (54.2 %), Hispanic (19.4%), and African American (6.9%). Among language minority students, there were quite a number of students classified as Redesignated (44.2%) and Limited English Proficient (12.6%).

Table 5 . Demographic Variables of Students by Treatment Status

	Control Schools (<i>n</i> = 1,932)		Word Generation Schools (<i>n</i> = 3,237)		All Schools (<i>N</i> = 5,169)	
	<i>n</i>	%	<i>n</i>	%	<i>N</i>	%
Female	947	49.0%	1,565	48.3%	2,702	52.3%
Special Education	172	8.9%	262	8.1%	434	8.4%
Free and Reduced Lunch Eligible	1,340	69.4%	1,961	60.6%	3,301	63.9%
Gifted and Talented Education Program	775	40.1%	1,528	47.2%	2,303	44.6%
<u>Ethnic/Race</u>						
Asian	1,118	57.9%	1,682	52.0%	2,800	54.2%
Southeast Asian	92	4.8%	129	4.0%	221	4.3%
African-American	138	7.1%	217	6.7%	355	6.9%
Hispanic	394	20.4%	610	18.8%	1,004	19.4%
White	110	5.7%	370	11.4%	480	9.3%
Other Non-White	80	4.1%	229	7.1%	309	6.0%
<u>Language Status</u>						
Limited English Proficient (LEP)	303	15.7%	347	10.7%	650	12.6%
Redesignated (RFEP)	917	47.5%	1,367	42.2%	2,284	44.2%
English proficient	526	27.2%	1,164	36.0%	1,690	32.7%
Fluent	184	9.5%	356	11.0%	540	10.4%
<u>Primary Language</u>						
English	806	41.7%	1,549	47.9%	2,355	45.6%
Mandarin	568	29.4%	949	29.3%	1,517	29.3%
Spanish	262	13.6%	400	12.4%	662	12.8%
Other Language	296	15.3%	339	10.5%	635	12.3%

Note. Language Status- not listed were 7 students who were categorized as “pending”; Among Asian students, 2,240 (78%) were identified as Chinese; Primary language measured by the most frequent language used at home; 629

(63.5%) of Hispanic students indicate Spanish as their primary language; 5,169/5,786 (89.3%) of the students had demographic data.

Data

This section discusses the (a) data collection procedures and (b) measures regarding the four data sources used in the study: (1) classroom observations conducted by trained observers, (2) surveys completed by students, (3) demographic data provided by the district, and (4) students' academic scores.

Classroom Observations

Procedures

Classroom observations were conducted in all major content-area classrooms (English language arts, math, science, and social studies) across treatment and control schools. Observers attended training sessions that instructed on using standardized codes (See Figure 17 in the Appendix) to rate conversational moves observed among students and teachers in video footage of classroom discussion. In the classroom evaluation phase, participating teachers were randomized and a schedule was created identifying specific observation periods to be conducted on a given day. Up to three observers were assigned to rate classrooms in treatment and control schools.

Table 6 presents the frequency and distribution of classrooms observed in each school. In five schools, observations were equally distributed among ELA, math, science and social studies classrooms. However, a majority of the schools had an unbalanced mix of classrooms observed. For example, Hemlock had twice as many ELA/social studies classes observed than math/science classes.

Table 6. Frequency of Classroom Observations Per School

	ELA		MATH		SCIENCE		SOCIAL STUDIES		ALL CONTENT AREAS	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>N</i>	%
Control										
Duffie Oak	2	12.5%	4	23.5%	2	12.5%	4	23.5%	12	18.2%
Evergreen	2	12.5%	1	5.9%	2	12.5%	2	11.8%	7	10.6%
Honeysuckle	4	25.0%	4	23.5%	4	25.0%	4	23.5%	16	24.2%
Maple	2	12.5%	2	11.8%	2	12.5%	2	11.8%	8	12.1%
Rosemary	2	12.5%	2	11.8%	2	12.5%	1	5.9%	7	10.6%
Vineland	4	25.0%	4	23.5%	4	25.0%	4	23.5%	16	24.2%
TOTAL	16		17		16		17		66	
Treatment										
Apple	4	20.0%	3	17.6%	4	22.2%	4	22.2%	15	20.5%
Arbola	2	10.0%	2	11.8%	2	11.1%	2	11.1%	8	11.0%
Flower Square	2	10.0%	2	11.8%	2	11.1%	2	11.1%	8	11.0%
Hemlock	4	20.0%	2	11.8%	2	11.1%	4	22.2%	12	16.4%
Moon	4	20.0%	4	23.5%	4	22.2%	2	11.1%	14	19.2%
Palm	4	20.0%	4	23.5%	4	22.2%	4	22.2%	16	21.9%
TOTAL	20		17		18		18		73	
GRAND TOTAL	36	25.9%	34	24.5%	34	24.5%	35	25.2%	139	

Measures

Observers assessed the degree to which classrooms supported rich and active discussions based on the following four rubrics: (1) support for participation, (2) student engagement, (3) teacher talk moves, and (4) substantive contributions. Table 7 is a summary on the discussion quality rubrics with correlations.

- *Support for Participation.* Each observer rated the extent to which the teacher created a well-ordered environment that enabled engagement with lesson content and participation in discussions. Based on a three-point scale, observers gave a rating of 1 for classrooms lacking a well-ordered environment and 3 for classrooms where students were consistently engaged and minimally distracted. In observed classrooms with more than one observer, 13 out of the 13 observations received exact matches in this category.

- *Student Engagement*. This rating was based on the number of students participating or attending to the classroom discussions. Based on a three-point scale, observers gave a rating of 1 for classrooms where less than a quarter of students participated in discussion and a 3 for classrooms with at least half of the students participating in discussion. The interrater reliability of classrooms with more than one observer was quite high ($\kappa = 0.83$). All but one of the 13 observations received exact matches in this category.
- *Teacher Talk Moves*. This rating was based on teachers' frequency of initiating open-ended questions and follow-up questions requiring students to explain their thinking. Based on a five-point scale, observers rated classrooms as 1 for those where teachers mainly posed closed-ended questions that imply an evaluation on students to add certain information. Observers gave a rating of 5 for classrooms where teachers typically initiate open-ended questions that encourage students to construct and justify their claims. All but one of the 13 observations received exact matches in this category.
- *Substantive Contributions*. Each observer rated students' intellectual contributions during classroom discussions. Based on a five-point scale, observers rated classrooms as 1 for those where students mainly provided cursory or surface-level understandings of the material. Observers gave a rating of 5 for classrooms where a majority of students contributed ideas that reflect thoughtful consideration of how their claims may be reconciled with competing views. The interrater reliability of classrooms with more than one observer was also quite high ($\kappa = 0.71$) with 11 out of the 13 observations getting exact matches in this category).

Table 7. Rubrics Used to Rate Classroom Discussion Quality in Content Area Classrooms Observed

Measure	Context	Scale	Low (1)	High (5)	Interrater reliability
Student Engagement	Student	1-3	Less than a quarter of students participated in discussion	At least half of students participated in discussion	$\kappa = 0.83-1.00$
Talk Moves	Teacher	1-5	Teacher mainly posed closed-ended questions	Teachers frequently posed open-ended questions	$\kappa = 0.83-1.00$
Support for Participation	Classroom	1-3	Classroom lacked a well-ordered environment	Classroom supported an environment where students were minimally distracted	N/A
Substantive Contributions	Student	1-5	Students provided cursory understanding of the material	Students gave thoughtful consideration in terms of reconciling competing views	$\kappa = 0.71-1.00$

Note. Interrater reliability indicates the rating agreement between observation periods with at least two or more observers.

Student Surveys

Procedure

As discussed previously, I was involved with developing and validating the instrument used to assess students' civic engagement. To ensure validity of the survey items, I worked with members of the research team to conduct cognitive lab interviews and piloting of the survey items (See Figure 4). The first stage involved conducting cognitive lab interviews with middle school students ($n = 5$) enrolled in the school district to develop meaningful survey items appropriate to the context of youth from diverse population ⁷ (See Figure 14 in Appendix). The cognitive lab interviews were conducted according to the procedures prescribed by Ericsson and Simon (1998). Participants were prompted to explicitly “think aloud” as they discussed the context in which they engaged in civic activities at school and neighborhood. The data was analyzed to develop appropriate survey items on civic engagement. The survey items were refined and then piloted with students in two classrooms ($n = 64$) that implemented the WG program. Additional rounds of survey revisions were conducted with several experts in the research team. After consensus and approval was reached, the survey items were administered to students.

During the two testing days in May 2012, students in treatment and control conditions completed a series of testing on vocabulary, reading, motivation, and civic engagement measures (See Figure 16 in the Appendix). At the time of assessment, students in the treatment group were essentially at the point of fully completing the program –completing exposure all but the final controversial topic (e.g. “Dating violence: Who is responsible?”).

⁷ After defining the theoretical framework of the measures, focus groups and/or interviews are usually conducted to develop instruments that measure youth civic engagement. This process is critical to capture the language and context that reflect the language of the population under study (Torney-Purta, Amadeo, & Andolina, 2010).

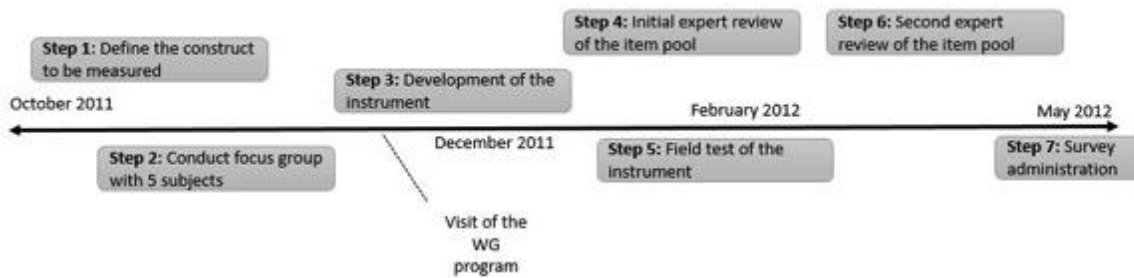


Figure 4. *Timeline of Events Leading to the Development and Administration of the Survey Items Measures*

- *Civic Engagement.* Students responded to the following three items on how often they help their friends, school, and community. Each item was answered based on a five-point Likert scale of (1) *never*, (2) *rarely*, (3) *sometimes*, (4) *often*, and (5) *always*.
 - “How often do you help poor people in your city?”
 - “How often do you help your school?”
 - “How often do you help your friends?”
- *Voting interest:* Students responded to the item “How interested are you in voting for the President when you get older?” The item was answered based on a five-point Likert scale of (1) *not at all interested*, (2) *slightly interested*, (3) *somewhat interested*, (4) *quite interested*, and (5) *extremely interested*.
- *Interest in Classroom Discussions of Controversial Issues.* Students responded to three questions, where they rated their own efforts and perceived efforts from classmates and teachers to discuss controversial issues in the classroom. Students responded to each item on a five-point Likert scale of (1) *never*, (2) *rarely*, (3) *sometimes*, (4) *often*, and (5) *always*.
 - “How often do you talk about news events in your class?”
 - “How often do your classmates discuss news events in class?”

- “How often does your teacher discuss news events in class?”
- *Political Interest.* Students responded to two items assessing the degree to which they are interested in politics and events going on in the world. Each item was answered on a five-point Likert scale of (1) *not at all interested*, (2) *slightly interested*, (3) *somewhat interested*, (4) *quite interested*, and (5) *extremely interested*.
 - “How interested are you in events that are going on in the world?”
 - “How interesting do you find politics?”

District Data

Procedure

For the purposes of evaluating the WG program, the school district provided demographic data with information on students’ gender, grade level, ethnicity/race, school status (language minority status, GATES, and special education), and eligibility in the free and reduced lunch status program. 5,169 or 89.3% of the students had complete demographic data.

Measures

- *Treatment.* Students who participated in the Word Generation program were coded as (*TREAT* = 1) or participated in the control schools (*TREAT* = 0).
- Gender (*FEMALE*) is a dichotomous variable coded as female (*FEMALE* = 1) or male student (*FEMALE* = 0).
- In terms of students’ grade levels, *GRADE 6* indicates whether a student is in sixth grade (*GRADE 6* = 1) or not (*GRADE 6* = 0). *GRADE 7* indicates whether a student is in seventh grade (*GRADE 7* = 1) or not (*GRADE 7* = 0). *GRADE 8* indicates whether a student is in seventh grade (*GRADE 8* = 1) or not (*GRADE 8* = 0).

- Data on students' racial/ethnic background were coded according to the following groups. The *ASIAN* variable indicates whether a student identified themselves as originating from Korean, Chinese, Japanese, and Cantonese descent (*ASIAN* = 1) or not (*ASIAN* = 0). The *SOUTHEAST_ASIAN* variable indicates whether a student identified themselves as originating from Thai, Filipino, Vietnamese, and Cambodian descent (*SOUTHEAST_ASIAN* = 1) or not (*SOUTHEAST_ASIAN* = 0). The *AFRICAN AMERICAN* variable indicates whether a student identified themselves as African American/Black (*AFRICAN AMERICAN* = 1) or not (*AFRICAN AMERICAN* = 0). The *HISPANIC* variable indicates whether a student identified themselves as originating from Mexican American/Hispanic/Latino heritage (*HISPANIC* = 1) or not (*HISPANIC* = 0). The *WHITE* variable indicates whether a student identified themselves as Caucasian (*WHITE* = 1) or not (*WHITE* = 0). The *OTHER_NON-WHITE* variable indicates whether a student identified themselves as Arabic, Samoan or other non-White (*OTHER_NON-WHITE* = 1) or not (*OTHER_NON-WHITE* = 0).
- Data on students' primary language were coded according to the following groups: (1) English, (2) Chinese, (3) Spanish, and (4) Other language.
- Eligibility in the Free and Reduced Lunch program at school is used as a proxy indicating students from low-income background. The variable (*FREE AND REDUCED LUNCH STATUS*) is a dichotomous variable coded as whether the student is qualified for Free and Reduced Lunch status (*FREE AND REDUCED LUNCH STATUS* = 1) or not (*FREE AND REDUCED LUNCH STATUS* = 0).
- Regarding students' designated school status, students were coded as whether they participated in a Special Education and Gifted and Talented Education (GATE) program. Special Education status is indicated by the variable (*SPECIAL EDUCATION*), which is a

dichotomous variable coded as whether the student is enrolled in Special Education programs (*SPECIAL EDUCATION* = 1) or not (*SPECIAL EDUCATION* = 0). Gifted and Talented Education is a specialized program for high potential and exceptional students. The variable (*GATE*), is a dichotomous variable coded as whether the student is in a GATE program (*GATE* = 1) or not (*GATE* = 0).

- Language minority students were coded on whether they belonged to the following groups: Limited English Proficiency (LEP) and Redesignated (RFEP). Students with limited English proficiency and eligible for language support were coded as LEP (*LEP* = 1) or not (*LEP* = 0). Language minority students originally classified as being a LEP who attained satisfactory English proficiency were coded as Redesignated (*RFEP* = 1) or not (*RFEP* = 0).

Academic Scores

Procedure

Students completed the Gates-MacGinitie reading comprehension assessment in Fall 2011 and Spring 2012. The test is a 48-item assessment used to measure students' overall reading comprehension. The test includes 14 short multiple-paragraph passages from a wide range of domains including, narrative, autobiographical, biology and history to measure comprehension at the passage level. The level 6 Form T was administered to 6th graders and level 7/9 Form T was given to 7th and 8th graders.

Measure

The *ACADEMIC_ABILITY* measure is based on students' pretest scores (Fall 2011) on the Gates-MacGinitie reading comprehension. Preliminary analyses suggest that the WG program slightly improved reading comprehension scores among 6th and 7th grade students;

however, this was not found to be case for 8th graders (See Table 20 in Appendix). Extended scale scores ranged from 353 to 643.

Analysis Plan

This section provides an overview of how the data was prepared and then discusses the analytical strategies used to answer each of the research questions.

Data Preparation

This section is an overview of procedures used to prepare the data prior to conducting substantive analysis in this study.

Classroom Discussion Quality Rating

This study replicates the approach used in a past WG evaluation (Lawrence et al., *under review*), which involves creating a composite of the four rubrics used to measure the quality of classroom discussion and later transformed into a weighted school level discussion quality ratings. This process facilitates comparisons of scores across classrooms that accounts for different content areas observed.

- *Classroom discussion quality rating*: Rubric scores were divided by the number of possible points available in that category, in order to place the three and five-point ratings on the same scale. Adding these scores equaled a maximum of four points ($CLASSROOM_DISCUSSION_QUALITY_RATING = PARTICIPATION/3 + ENGAGEMENT/3 + TALK_MOVES/5 + SUBSTANTIVE/5$). Classroom discussion quality rating ranged from 1.07 to 3.80 (out of a possible total of 4.00).
- *Standardized discussion quality rating*. Next, I standardized the overall classroom discussion quality rating to account for the fact that average *CLASSROOM _DISCUSSION _QUALITY _RATING* discussion scores varies systematically across content

area. This procedure consisted of transforming the discussion scores of each content area to z-scores ($z_{CLASSROOM_DISCUSSION_QUALITY_RATING}$) to allow comparisons between observation scores in different content areas. For example, the mean of $CLASSROOM_DISCUSSION_QUALITY_RATING$ scores of all observations of math class is zero, with a standard deviation of 1 (similar to all other content areas). This standardized discussion quality rating was then used to create the weighted school-level discussion quality rating (described in the next section).

- *Weighted school level discussion quality ratings.* School level discussion quality ratings ($WEIGHTED_CLASSROOM_DISCUSSION_QUALITY_RATING$) were created for each school by averaging the $z_{CLASSROOM_DISCUSSION_QUALITY_RATING}$ scores for the observations completed at the school level⁸. This transformation facilitates comparisons of scores across classrooms despite differences in the number of content areas observed. The strength of this approach is to avoid penalizing schools with a higher proportion of observed science and math courses, where there tends to be a higher focus on lecture and less emphasis on discussion. The mean of the $WEIGHTED_CLASSROOM_DISCUSSION_QUALITY_RATING$ scores across all the schools is zero with a standard deviation of one.

Civic Engagement and Political Interest

The three civic engagement survey items were used to develop the scaled score ($CIVIC_ENGAGEMENT$) with an Eigenvalue of 1.05 (See Table 8). Two items were developed into a scaled score for political interest ($POLITICAL_INTEREST$) with a 0.61 factor loading.

Table 8. Components of the Civic Engagement Factor Score

Measures	Mean (0-5)	SD	Factor loading (varimax rotation)
Civic engagement			
How often do you help your friends?	3.94	0.90	0.54
How often do you help your school?	2.91	0.94	0.55
How often do you help poor people in your city?	2.52	1.01	0.57

Analytic Strategy

Research Question 1a

Did classrooms in WG schools have higher ratings on discussion quality than those that did not use the WG?

To answer Research Question 1a, classroom observation data will be used to determine if there are significant differences in classroom discussion between treatment and control conditions. Before discussing the statistical test used to answer this research question, it is important to clarify the approach of analyzing classroom discussion quality at the observation level similar to a previous Word Generation evaluation (Lawrence et al., *under review*). At the core of implementing the WG program are grade level teaching teams of ELA, science, social studies and math teachers. However, there was an uneven distribution of observations conducted across content areas. For example, if a teaching team observation score contained only social studies with no ratings for math and science, then this score could not be generalized to the other content areas classrooms associated with this particular teaching team. Thus, the analysis considers analyzing classroom discussion quality at the observation-level, rather than teaching-team level.

⁸ Weighed scores were calculated based on the sum of all standardized content area scores i.e. $egen\ weighted_rub_tot_Y3 = rsum(z_rub_tot_ELA_Y3\ z_rub_tot_MATH_Y3\ z_rub_tot_SCIENCE_Y3\ z_rub_tot_SS_Y3)$. School means were then created.

The statistical test used to answer the research question is a two-sample comparison t -tests used to determine if differences in the *CLASSROOM_DISCUSSION_QUALITY_RATING* variable between treatment and control classrooms are statistically significant. The “ttest” command in STATA software is used to conduct the t -test analysis. The null hypothesis is that the population mean of individual differences of paired observation is D0 (zero unless explicitly specified). If the null hypothesis is rejected, the test found a significant difference (effect) between the treatment and control group (Bluman, 2008).

Research Question 1b:

How did students perceive their own interest and efforts to engage discussions of controversial issues? How did students rate classmates and teachers’ effort to engage in discussions of controversial issues?

Research Question 1b is answered by analyzing three measures developed from the students’ responses on survey items. Two sample comparison t -tests are used to determine whether there are statistically significant differences between students in the treatment and control schools on the three measures: *OFTEN_DISCUSS_CLASSROOM*, *PERCEIVED_CLASSMATE_DISCUSS*, and *PERCEIVED_TEACHER_DISCUSS*.

Research Question 2a:

Did participating in the WG program have a positive impact on students’ self-reported civic engagement and voting interest?

Research Questions 2A is answered by determining whether participating in the WG program has a significant impact on students’ self-reported civic engagement and voting interest. This analysis utilizes regression analyses with adjusted standard errors that accounts for clustering at the teaching team grade level. Including a cluster option (“vce”) in the regression command assumes that observations are clustered within grade level teaching teams, which takes

into account that observations may be correlated (Murnane & Willett, 2010). As discussed previously, this study analyzes grade level teaching teams as the “units of implementation” in regards to the WG program. This analytical approach is similar to other studies that considered “teachers” or “classrooms” units in non-cross content area designs (Lawrence et al., *under review*). The hypothesized regression model for RQ 2 is:

$$\begin{aligned}
 CIVIC\ ENGAGEMENT_i = & \beta_0 + \beta_1 TREAT_i + \beta_2 FEMALE_i + \beta_3 GRADE_7_i + \beta_4 GRADE_8_i \\
 & + \beta_5 ASIAN_i + \beta_6 BLACK_i + \beta_7 HISPANIC_i + \beta_8 OTHER_RACE_i \\
 & + \beta_9 FREE_AND_REDUCED_LUNCH_STATUS_i + \\
 & + \beta_{10} LEP_i + \beta_{11} RFEP_i + \beta_{12} GATE_i + \\
 & + \beta_{13} SPECIAL_EDUCATION_i + \beta_{14} POLITICAL_INTEREST_i + \\
 & + \beta_{15} ACADEMIC_ABILITY_i + \epsilon_i
 \end{aligned}$$

where $CIVIC\ ENGAGEMENT_i$ is the student-reported civic engagement measure of the i^{th} student. β_0 is the regression intercept and slope parameters, respectively and the ϵ_i are the residuals. The slope parameter $\beta_1 TREAT_i$ represents the average treatment effect- the average difference in the civic engagement outcomes between students who participated in the WG program and those who did not. Preliminary analysis conducted on an imputed dataset that accounts for patterns of data missingness did not yield significantly different results⁹; thus, the non-imputed dataset is presented as the final results of the study.

Research Question 2b:

To what extent does students’ ethnic identification (e.g. Latino, African-American, and Asian) influence the direction and strength of the relationship between program participation and self-reported civic engagement?

⁹ The purpose of multiple imputation is to create multiple data sets that each contain different imputed values instead of creating a single imputed dataset or losing variables due to missingness (Rubin, 2009). Five imputed datasets were created using

To answer Research Question 2B, interaction terms are added to the model to determine if students' ethnic identification moderates the relationship between program participation and self-reported civic engagement. The hypothesized model consists of determining whether the moderator (racial ethnicity) alters the relationship strength between the predictor (WG program participation) and the outcome (civic engagement). The first step is to examine all the individual variables contained in the interaction(s) and include them into the model (Baron & Kenny, 1986; West, Aiken & Krull, 1996). The interaction term consists of the product of the predictor (WG program participation) and moderator (ethnic identification) variables. A moderator effect is present if the interaction term is found to be statistically significant (Bennett, 2000; Frazier, Baron & Tix, 2004).

$$\begin{aligned}
 CIVIC\ ENGAGEMENT_i = & \beta_0 + \beta_1 TREAT_i + \beta_2 FEMALE_i + \beta_3 GRADE_7_i + \beta_4 GRADE_8_i \\
 & + \beta_5 ASIAN_i + \beta_6 BLACK_i + \beta_7 HISPANIC_i + \beta_8 OTHER_RACE_i \\
 & + \beta_9 FREE_AND_REDUCED_LUNCH_STATUS_i + \\
 & + \beta_{10} LEP_i + \beta_{11} RFEP_i + \beta_{12} GATE_i + \\
 & + \beta_{13} SPECIAL_EDUCATION_i + \beta_{14} POLITICAL_INTEREST_i + \\
 & + \beta_{15} ACADEMIC_ABILITY_i + \beta_{16} TREAT_i * ASIAN_i \\
 & + \beta_{17} TREAT_i * HISPANIC_i + \beta_{18} TREAT_i * BLACK_i + \varepsilon_i
 \end{aligned}$$

Research Question 3a:

To what extent does the classroom discussion quality rating correlate with students' self-reported civic engagement? How do schools compare with each in other in terms of classroom discussion quality and self-reported civic engagement?

Research Question 3a consists of examining the relationship between classroom discussion quality and students' self-reported civic engagement at the school level. This analysis

the "mi impute" command in STATA. The analysis runs the statistical model on each of the imputed datasets and the multiple

will use a merged dataset that combines observation and survey data. A correlation test using the “pwwcorr” command in STATA calculates a Pearson product-moment correlation coefficient that measures the linear relationship between the two variables: classroom discussion quality and students’ self-reported civic engagement. The correlation coefficient gives a value between +1 and -1 inclusive, where 1 is total positive correlation, 0 is no correlation, and -1 is total negative correlation (Allison, 1999). Additional analyses examining classroom discussion quality and students’ self-reported civic engagement at the school level are presented using: (1) descriptive on school mean scores and (2) scatterplot graphs.

Research Question 3b:

To what extent did improved classroom discussion mediate the relationship between students’ participation in the WG program and their self-reported civic engagement?

To answer research question 3b, I plan to examine whether improved discussion quality mediates the relationship between students’ participation in the WG program and their self-reported civic engagement. The purpose of the mediation analysis is to assess whether the relationship between the independent and dependent variable “is due, wholly or in part, to the mediator” (Krull & MacKinnon, 2001, p. 249). Figure 5 is a visual representation of the hypothesized model that will be analyzed in the mediation analysis. Mediation analysis will be conducted by taking the following steps: (1) I will first estimate the treatment effects on the mediators, β_a where the mediator is modeled as an outcome. (2) Next, I will estimate the effects of the mediators on students’ self-reported civic engagement outcomes, β_b . (3) The product of $\beta_a \beta_b$ is the mediated effect. Various simulation studies have shown that the $\beta_a \beta_b$ estimator is the most efficient and the preferred choice in cluster-based intervention studies (Krull &

analyses are combined to yield a single set of results with corrected standard errors.

MacKinnon, 2001; Tate & Pituch, 2007). Mediation analysis is conducted using the “ml_mediation” command in STATA software.

The analysis is a combination of single-level and multilevel modeling (2→2→1) because the treatment and mediator is measured at level 2 and the outcome is a level 1 variable (Krull & MacKinnon, 2001). In other words, the treatment ($TREAT_j$) and mediator ($CLASSROOM_DISCUSSION_QUALITY_RATING_j$) variables are measured at the group level, and the individual outcome relates to students’ survey responses ($CIVIC_ENGAGEMENT_i$). This procedure suggests the interpretation that program effects are mediated through a school level, rather than a teaching-team level, measure of classroom discussion quality¹⁰.

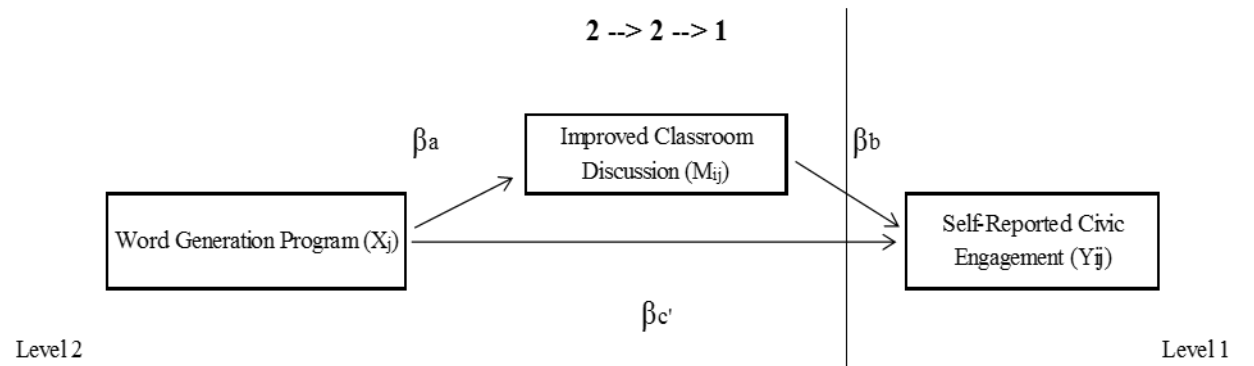


Figure 5. Hypothesized Model to Assess Classroom Discussion Mediating the Relationship between Word Generation Program Participation and Students’ Self-Reported Civic Engagement

¹⁰ The current study shares similar concerns with a past evaluation that relied on a school-level aggregate of classroom discussion quality to assess mediation of the WG program’s effect on students’ academic vocabulary (Lawrence et al., *under review*). The reason for relying on the school-level aggregate measure are two-fold: (1) uneven distribution of content areas observed and (2) students cannot be linked to their respective teaching teams. One concern in using a school-level aggregate of classroom discussion quality is that discussion quality does not vary across classrooms. Put another way, this limitation does not take into account that two students from the same school may experience differing amounts of discussion quality in their classrooms.

CHAPTER 3: RESULTS

Research Question 1a:

Did classrooms in WG schools have higher ratings on discussion quality than those that did not use the WG?

In Table 9, ratings of classroom discussion found in content area are reported. In total, 139 observations were randomly sampled across content-area classrooms. Although control classrooms received higher discussion scores in science ¹¹ ($M = 2.48$, $SD = 0.68$), treatment classrooms had higher discussion scores in Math ($M = 2.41$, $SD = 0.59$) and ELA ($M = 2.69$, $SD = 0.45$). In social studies, treatment classrooms ($M = 2.71$, $SD = 0.66$) had significantly higher ratings than control classrooms ($M = 2.21$, $SD = 0.56$), $t(34) = -2.02$, $p < .05$. The next analysis examines the overall scores of classroom discussion quality.

The research question is answered by analyzing the weighted total scores of classroom discussion in treatment and control schools. Classrooms using the WG program received higher overall weighted scores on classroom discussion quality than those in the control schools. Based on t -test results, the difference of 0.37 between treatment ($M = 0.17$; $SD = 0.62$) and control ($M = -0.19$; $SD = 0.99$) was found to be statistically significant, $t(137) = -2.05$, $p < 0.01$. The difference in average scores was used to calculate the average treatment effect (Cohen's $d = 0.37$). Although the results suggest that overall classroom discussion scores, on average, were higher in treatment than control schools, science courses using the WG program did not improve in discussion quality.

¹¹ Further analysis was conducted to examine implementation of the WG program in science classes (See Appendix section). Compared to ELA ($M = 0.48$), math ($M = 0.42$), and social studies ($M = 0.40$) classrooms, science ($n = 18$) had the lowest scores in terms of content area fidelity measures of the WG program. For example, less than half of the classrooms (47%) observed report that teachers "asked students for evidence to support their conclusions". This finding suggests that the extent to which WG program was implemented was found to be less consistent in science classrooms than all other content areas.

Table 9. Classroom Discussion Quality Rating by Treatment Status and Content-Area Observed with T-test Results and Estimated Effect Sizes

	Word Generation Schools			Control Schools			All Schools			Difference (WG - Control Schools)	Effect size (Cohen's d)
	N	M	SD	N	M	SD	N	M	SD		
ELA	20	2.69	0.45	16	2.37	0.58	36	2.55	0.53	+ 0.33	
Math	17	2.41	0.59	17	2.15	0.59	34	2.28	0.62	+ 0.26	
Science	18	2.23	0.69	16	2.48	0.68	34	2.35	0.69	- 0.24	
Social Studies	18	2.71	0.66	17	2.21	0.56	35	2.46	0.65	+ 0.49 *	
Overall (Non-Weighted)	73	2.52	0.62	66	2.29	0.61	139	2.41	0.63	+ 0.22 *	0.35
Overall (Weighted)	73	0.17	0.96	66	-0.19	0.99	139	0.00	0.99	+ 0.37 *	0.37

Note. Discussion quality rating is an average score (out of a possible total of 4) based on: (1) Teacher talk moves (out of 5) (2) Substantive contributions (out of 5) and (3) Support for Participation (out of 3) and (4) Student Engagement (out of 3). * $p < 0.05$, ** $p < 0.01$, *** $p < 0.00$.

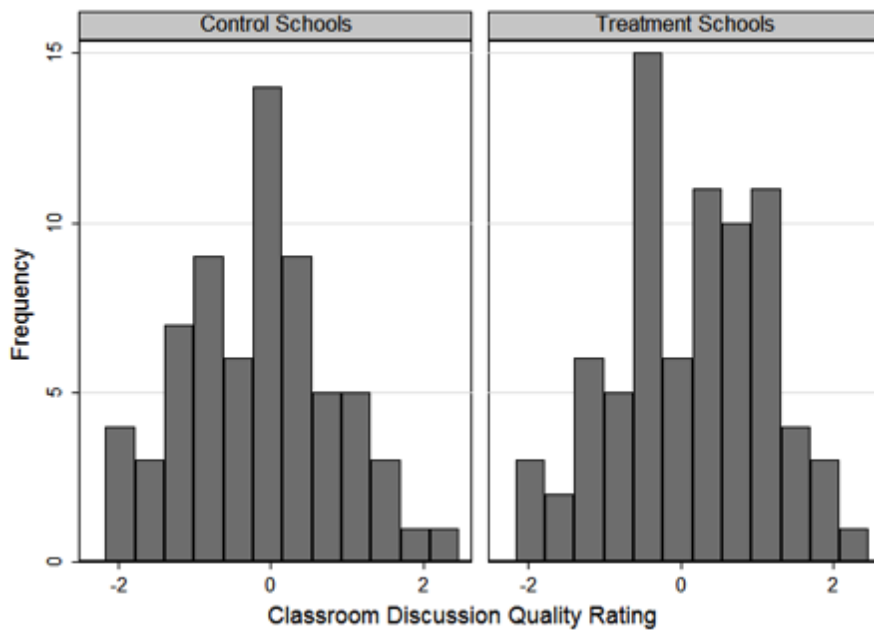


Figure 6. Histogram of Classroom Discussion Quality Rating Given in Classroom Observations by Treatment Status

A histogram (Figure 6) compares the weighted classroom discussion quality ratings between classrooms in treatment and control schools. Distribution of classroom discussion quality rating in control schools has a left skewness (skewness = 0.144) with a light-tailed

distribution (kurtosis = 2.249). In treatment schools, distribution of classroom discussion quality tends to skew to the right as confirmed by a skewness test (skewness = -0.008) with also a light-tailed distribution. Although treatment schools have a few classrooms with below average classroom discussion, there appears to be more instances of highly engaging discussions in treatment than control schools.

Research Question 1b:

How did students perceive their own interest and efforts to engage discussions of controversial issues? How did students rate classmates and teachers’ effort to engage in discussions of controversial issues?

Table 10 presents mean scores on how students rated their own efforts to discuss controversial issues between those in treatment and control conditions. These results indicate that on average, students in the WG program expressed more effort to talk about controversial issues, in comparison with those in the control schools. *T*-test results indicate that the difference of 0.08 between treatment ($M = 2.54$; $SD = 1.05$) and control ($M = 2.46$; $SD = 1.14$) was statistically significant, $t(4,963) = -2.83, p < 0.001$.

Table 10. *T-test Results of Students’ Average Rating on Efforts from Themselves, Classmates, and Teachers to Engage in Classroom Discussions of Controversial Issues Comparing between those in Treatment and Control Conditions*

	Word Generation Schools			Control Schools			All Schools			Difference (WG - Control Schools)
	<i>n</i>	<i>M</i>	<i>SD</i>	<i>n</i>	<i>M</i>	<i>SD</i>	<i>n</i>	<i>M</i>	<i>SD</i>	
How often do you talk about news events in your classes?	3,124	2.54	1.05	1,845	2.46	1.14	4,969	2.51	1.09	+ 0.08 ***
How often do your classmates discuss news events in class?	3,122	2.77	1.07	1,844	2.83	1.27	4,966	2.79	1.18	- 0.05
How often does your teacher discuss news events in class?	3,120	2.87	1.04	1,840	2.76	1.09	4,960	2.82	1.06	+ 0.11 ***

Note. Students answered the three items based on a 5-point Likert scale from (1) never to (5) always; * $p < 0.05$, ** $p < 0.01$, *** $p < 0.00$.

Mean scores are also presented on how students rated their classmates and teachers to engage in discussion of controversial issues with comparisons between those in treatment and

control conditions. On average, students in the control schools were more likely to report seeing their classmates actively engaged in discussing controversial issues, in comparison with those in the WG schools. However, treatment students reported higher ratings than control students on teachers' willingness to facilitate discussions of controversial issues. Based on *t*-test results, the difference of 0.11 between the average of students' rating in treatment ($M = 2.87$; $SD = 1.04$) and control ($M = 2.76$; $SD = 1.09$) groups was statistically significant, $t(4,959) = -3.83$, $p < 0.001$. These findings confirm earlier observations showing that teachers were actively engaged in facilitating classroom discussions of controversial issues.

Research Question 2a:

Did participating in the WG program have a positive impact on students' self-reported civic engagement and voting interest?

The first section is descriptive analyses based on comparing mean scores of students' civic engagement (Table 11) and voting interest (Table 12) between those in treatment and control schools. Among 6th and 7th graders, students in the treatment schools reported significantly higher civic engagement scores than those in control schools (See Table 11). In regards to students across different ethnic/racial identification, Asian students who participated in the WG program were found to have higher self-reported civic engagement than their counterparts in the control schools. According to Table 12, 7th and 8th students who participated in the WG program reported higher voting interest than their counterparts in the control schools. Hispanic and African-American students reported higher self-reported voting interest than their counterparts in the control schools; this was not found to be the case for Asian students. The next analysis is used to answer the study's research question, which consists of estimating the WG

program’s effects on students’ self-reported civic engagement while taking into account possible confounding variables.

Table 11. Comparison of Students’ Self-Reported Civic Engagement Scores by Treatment Status Organized by Grade level, Gender, Ethnicity, and School Status with T-Test Results Indicating Difference

	WG School			Control School			Overall Sample			Difference (WG - Control schools)
	n	Mean	SD	n	Mean	SD	n	Mean	SD	
Grade level										
6th Grade	1,170	0.07	0.65	829	-0.06	0.68	1,999	0.02	0.67	+ 0.135 ***
7th Grade	1,169	0.04	0.66	722	-0.04	0.66	1,891	0.01	0.66	+ 0.081 **
8th Grade	1,112	-0.01	0.66	949	-0.02	0.63	2,061	-0.01	0.64	+ 0.005
Female	1,855	0.14	0.62	1,447	0.06	0.63	3,302	0.11	0.62	+ 0.074 ***
Race										
White	616	0.09	0.67	539	-0.03	0.68	1,155	0.03	0.68	+ 0.116 ***
Asian	1,937	0.02	0.63	1,604	-0.03	0.63	3,541	0.00	0.63	+ 0.058 ***
Hispanic	875	-0.03	0.70	819	-0.06	0.70	1,694	-0.04	0.70	+ 0.033
African-American	493	0.11	0.68	558	0.00	0.70	1,051	0.05	0.69	+ 0.104 **
Special Education	587	-0.08	0.75	540	-0.03	0.74	1,127	-0.05	0.75	+ 0.053
FRL	2,192	0.02	0.67	1,846	-0.04	0.66	4,038	-0.01	0.67	+ 0.059 ***
GATE	1,795	0.05	0.62	1,252	-0.03	0.62	3,047	0.02	0.62	+ 0.079 ***

Note. Civic engagement is based on a three-item measure relating to students' reported frequency of helping their friend, school, and community on a Likert scale of 1 "rarely" to 5 "always"; FRL refers to free and reduced lunch status; * $p < 0.05$, ** $p < 0.01$, *** $p < 0.00$.

Table 12. Comparison of Students’ Self-Reported Voting Interest by Treatment Status Organized by Grade level, Gender, Ethnicity, and School Status with T-Test Results Indicating Difference

	WG School			Control School			Overall Sample			Difference (WG - Control schools)
	n	Mean	SD	n	Mean	SD	n	Mean	SD	
Grade level										
6th Grade	1,163	3.21	1.34	821	3.29	1.31	1,984	3.24	1.33	- .0771
7th Grade	1,163	3.00	1.33	720	2.96	1.37	1,883	2.99	1.35	+ 0.041
8th Grade	1,109	3.08	1.30	945	3.02	1.27	2,054	3.05	1.29	+ 0.058
Female	1,846	3.16	1.30	1,440	3.14	1.33	3,286	3.15	1.31	
Race										
White	611	3.37	1.36	536	3.15	1.39	1,147	3.27	1.38	+ 0.219 ***
Asian	1,929	2.99	1.29	1,595	3.00	1.29	3,524	3.00	1.29	- 0.011
Hispanic	870	3.13	1.37	812	3.07	1.36	1,682	3.10	1.37	+ 0.051
African-American	489	3.31	1.33	554	3.17	1.40	1,043	3.24	1.37	+ 0.145 *
Special Education	535	3.18	1.37	581	3.02	1.39	1,116	3.09	1.39	+ 0.160 *
FRL	2,184	3.05	1.32	1,837	3.07	1.32	4,021	3.06	1.32	- 0.012
GATE	1,787	3.16	1.31	1,245	3.13	1.30	3,032	3.15	1.31	+ 0.021

Note. Voting interest is a single item measure that reflect interest in voting when student reaches legal age on a scale of 1 “not at all interested” to “extremely interested ; FRL refers to free and reduced lunch status; * $p < 0.05$, ** $p < 0.01$, *** $p < 0.00$.

Table 13. Regression Models Predicting Students' Self-Reported Civic Engagement (Scaled Score) and Voting Interest (Single Measure) with Standardized Coefficients and Adjusted Standard Errors in Parentheses

Variables	Civic Engagement					Voting Interest				
	1A	1B	1C	1D	1E	2A	2B	2C	2D	2E
Grade 7 ¹	0.034 (0.05)	0.034 (0.04)	0.034 (0.05)	0.035 (0.04)	0.035 (0.04)	-0.270** (0.08)	-0.271*** (0.07)	-0.161** (0.05)	-0.161*** (0.04)	-0.161*** (0.04)
Grade 8	-0.039 (0.05)	-0.032 (0.04)	-0.022 (0.05)	-0.015 (0.04)	-0.015 (0.04)	-0.193* (0.07)	-0.201** (0.07)	-0.148** (0.05)	-0.153** (0.05)	-0.151** (0.05)
Female ²	0.242*** (0.02)	0.243*** (0.02)	0.257*** (0.02)	0.258*** (0.02)	0.257*** (0.02)	0.109** (0.03)	0.108*** (0.03)	0.160*** (0.03)	0.160*** (0.03)	0.159*** (0.03)
FRL	-0.029 (0.02)	-0.027 (0.02)	-0.027 (0.02)	-0.025 (0.02)	-0.023 (0.02)	0.005 (0.03)	0.001 (0.03)	0.007 (0.03)	0.005 (0.03)	0.004 (0.03)
GATE	-0.027 (0.02)	-0.027 (0.02)	-0.028 (0.02)	-0.028 (0.02)	-0.028 (0.02)	0.034 (0.04)	0.034 (0.04)	0.032 (0.05)	0.032 (0.05)	0.032 (0.05)
Special Education	-0.133* (0.06)	-0.131* (0.05)	-0.139* (0.06)	-0.137* (0.06)	-0.136* (0.05)	-0.094 (0.10)	-0.096 (0.10)	-0.119 (0.10)	-0.12 (0.10)	-0.124 (0.10)
Ethnic/Race ³										
Asian	-0.043 (0.03)	-0.04 (0.03)	-0.016 (0.03)	-0.013 (0.03)	-0.005 (0.07)	-0.352*** (0.07)	-0.356*** (0.07)	-0.266*** (0.06)	-0.269*** (0.06)	-0.309*** (0.08)
Hispanic	-0.103* (0.04)	-0.102* (0.04)	-0.062 (0.04)	-0.061 (0.04)	-0.038 (0.08)	-0.156* (0.07)	-0.157* (0.07)	-0.019 (0.06)	-0.02 (0.06)	-0.019 (0.08)
Black	0.084 (0.05)	0.089 (0.05)	0.064 (0.04)	0.071 (0.04)	0.021 (0.08)	0.162 (0.09)	0.155 (0.09)	0.101 (0.07)	0.095 (0.07)	0.072 (0.12)
Language Minority ⁴										
LEP	-0.068 (0.04)	-0.063 (0.04)	-0.124** (0.04)	-0.118** (0.04)	-0.119** (0.04)	0.059 (0.09)	0.052 (0.09)	-0.112 (0.08)	-0.117 (0.08)	-0.117 (0.08)
RFEP	-0.023 (0.02)	-0.02 (0.02)	-0.032 (0.02)	-0.028 (0.02)	-0.028 (0.02)	-0.124** (0.04)	-0.128** (0.04)	-0.139** (0.04)	-0.142** (0.04)	-0.142** (0.04)
Academic Ability	0.008 (0.01)	0.005 (0.01)	-0.001 (0.01)	-0.005 (0.01)	-0.005 (0.01)	0.125*** (0.03)	0.129*** (0.03)	0.099*** (0.02)	0.102*** (0.02)	0.102*** (0.02)
Political Interest			0.172*** (0.01)	0.172*** (0.01)	0.172*** (0.01)			0.586*** (0.02)	0.586*** (0.02)	0.586*** (0.02)
Treatment		0.067* (0.03)		0.075* (0.03)	0.083 (0.08)		-0.087 (0.06)		-0.058 (0.04)	-0.093 (0.06)
Asian x Treatment					-0.012 (0.07)					0.062 (0.09)
Hispanic x Treatment					-0.038 (0.09)					-0.008 (0.10)
Black x Treatment					0.09 (0.08)					0.034 (0.15)
Intercept	-0.013 (0.06)	-0.062 (0.06)	-0.047 (0.07)	-0.102 (0.07)	-0.108 (0.10)	3.451*** (0.06)	3.514*** (0.08)	3.329*** (0.04)	3.371*** (0.05)	3.395*** (0.06)
N	5,149	5,082	5,082	5,082	5,082	5,075	5,075	5,075	5,060	5,060
Adjusted R ²	0.05	0.053	0.123	0.123	0.124	0.037	0.038	0.228	0.229	0.229

Note. Standard error adjusted for 36 teaching team clusters (in parentheses); Civic engagement is a scaled score based on a three-item measure relating to students' reported frequency of helping their friend, school, and community on a Likert scale of 1 "rarely" to 5 "always"; Voting interest is a single item measure that reflect interest in voting when student reaches legal age on a scale of 1 "not at all interested" to "extremely interested"; Coefficients for Other-Non-White, Southeast Asians, Primary Language status not shown for the sake of space; FRL refers to free and reduced lunch status; Academic ability based on Gates-MacGinitie reading comprehension; LEP refers to Limited English Proficient; RFEP refers to Redesignated; ¹ 6th graders used as reference group; ² Male used as reference group; ³ White students used as reference group; ⁴ English proficient students used as reference group; * $p < 0.05$, ** $p < 0.01$, *** $p < 0.00$.

Table 13 presents results from regression analyses with predicted effects on students' self-reported civic engagement (Outcome 1) and voting interest (Outcome 2). The table presents models with the following characteristics: demographic and school covariates (Model A), covariates with treatment variable (Model B), covariates with political interest (Model C), covariates with treatment and political interest (Model D) and inclusion of interactions (Model E).

Model 1A indicates that students identified as Hispanic are less likely to report being civically engaged ($\beta = -0.103, p < .05$) than their Caucasian counterparts. This finding is aligned with results showing that Limited English Proficient students report lower civic engagement than their English fluent counterpart. Model 1B indicates that treatment has a main effect on students' self-reported civic engagement. In the next model, adding political interest improved the model fit (R^2) from 0.05 to 0.12. Overall, Word Generation has a significant positive effect ($\beta = 0.075, p < .05$) on students' self-reported civic engagement while controlling for students' gender, grade level, and race. For interpretation purposes, participation in the WG program is associated with a 0.075 standard deviation increase in civic engagement.

Models 2A-2E measures the extent to which treatment and various covariates are related to students' voting interest. Students identified as Asians and Hispanics report significantly lower interest in voting than their Caucasian counterparts. Academic ability and political interest is strongly related to students' voting interest. Model 2D indicates that the WG program has a non-significant impact on students' voting interest. In sum, these results suggest that the WG program improves students' self-reported civic engagement, but not voting interest.

Research Question 2b:

To what extent does students' ethnic identification (e.g. Latino, African-American, and Asian) influence the direction and strength of the relationship between program participation and self-reported civic engagement?

According to Table 13, Model 1E predicts students' self-reported civic engagement and includes the interaction terms between treatment and various measures of students' racial/ethnic background. No significant interactions were found between treatment and all ethnic/racial identifications (i.e. Asian, African American, and Hispanic). Model 2E predicts students' voting interest and also includes the same interaction terms examined in Model 1E. No significant interactions were found between treatment and ethnic/racial identifications. These findings suggest that students from ethnic/racial minority backgrounds do not appear to gain additional benefits on their self-reported civic engagement and voting interest.

Research Question 3a:

To what extent does the classroom discussion quality rating correlate with students' self-reported civic engagement? How do schools compare with each in other in terms of classroom discussion quality and self-reported civic engagement?

Table 14 presents correlations between the key civic engagement items and the classroom discussion quality aggregated at the school level. A weak correlation is found between classroom discussion quality and students' self-reported civic engagement ($r = 0.029$) and voting interest ($r = 0.050$). Table 15 compares the relationship between school means of classroom discussion quality and students' self-reported civic engagement. The scatterplot (Figure 9) is a visual representation of the relationship between the school means of classroom discussion quality and students' self-reported civic engagement. Three WG schools with above average levels of

classroom discussion quality – Apple, Moon, and Palm –had high levels of students’ self-reported civic engagement. However, several of the control schools with below average discussion quality rating– Evergreen, Maple, and Duffie Oak – were found to have decent scores on students’ self-reported civic engagement. These results suggest a weak relationship between classroom discussion and students’ self-reported civic engagement.

Table 14. *Correlation between Students’ Self-Reported Civic Engagement Outcomes and Classroom Discussion Quality Rating Scores*

	1	2	3	4	5	6	7
1 Students' Self-Reported Civic Engagement	--						
2 Students' Self-Reported Voting Interest	0.266 *	--					
3 Classroom Discussion Quality Rating	0.029 *	0.050*	--				
4 Student Engagement	0.029 *	0.052 *	0.663 *	--			
5 Teacher Talk Moves	-0.020 *	0.025 *	0.637 *	0.237 *	--		
6 Support for Participation	0.069*	0.024	0.802 *	0.521 *	0.232 *	--	
7 Substantive Contributions	-0.014	0.053 *	0.832 *	0.358 *	0.661 *	0.417 *	--

Note. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.00$

Table 15. Comparisons of Students' Self-Reported Civic Engagement Outcomes and Classroom Discussion Quality Rating Scores by Schools

	Students' Self-Reported Civic Engagement			Classroom Discussion Quality Rating		
	<i>n</i> students	Mean	SD	<i>n</i> classrooms	Mean	SD
Treatment Schools						
Apple	1,044	0.06	0.65	15	0.17	0.87
Arbola	753	0.01	0.65	8	0.21	1.13
Flower Square	276	-0.02	0.66	8	-0.23	0.93
Hemlock	164	-0.16	0.68	12	-0.24	0.74
Moon	336	0.02	0.73	14	0.55	1.03
Palm	878	0.09	0.63	16	0.34	0.99
Total	3,451	0.04	0.66	66	0.17	0.96
	<i>n</i>	Mean	SD	<i>n</i>	Mean	SD
Control Schools						
Duffie Oak	348	-0.01	0.65	12	-0.29	1.02
Evergreen	111	-0.04	0.70	7	-0.76	1.12
Honeysuckle	409	-0.09	0.65	16	-0.23	0.76
Maple	687	-0.01	0.63	8	-0.51	0.77
Rosemary	611	-0.09	0.64	7	0.38	1.42
Vineland	334	0.03	0.71	16	0.07	0.96
Total	2,500	-0.04	0.65	69	-0.19	0.99

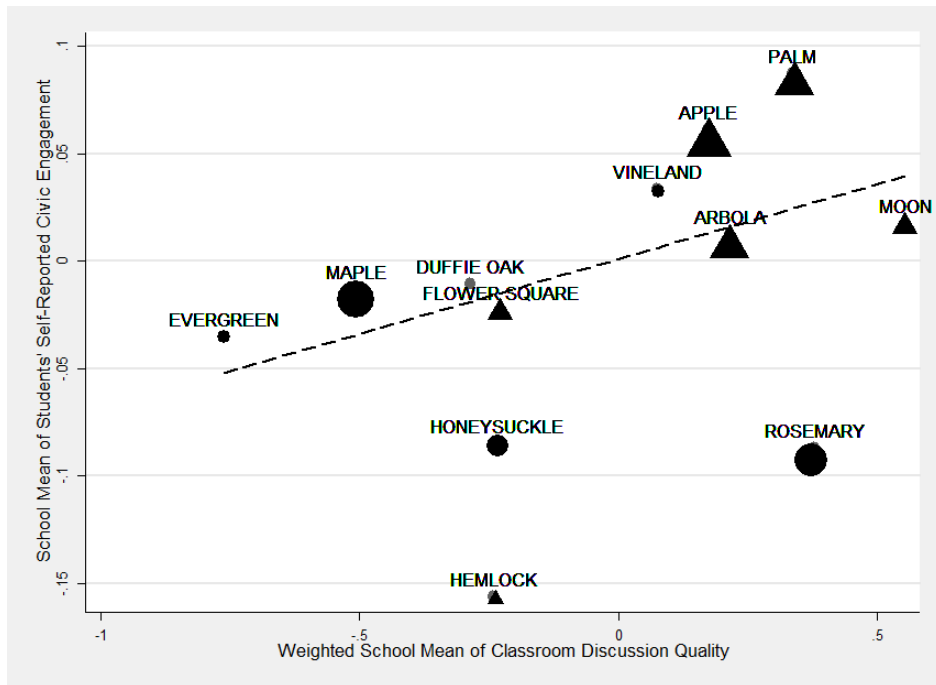


Figure 7. Scatterplot of the Relationship between Classroom Discussion Quality (School Mean) and Students' Self-Reported Civic Engagement (School Mean) with Fitted Line

Note: Treatment (Solid Triangle) and Control Schools (Solid Circle); Symbols are sized according to the proportion of students who contributed to civic engagement scores.

Research Question 3b:

To what extent did improved classroom discussion mediate the relationship between students' participation in the WG program and their self-reported civic engagement?

Table 16 displays the parameter estimates needed to conduct mediation analysis. The first column presents a model presenting estimates of the treatment effect on the mediator. Also known as a *path*, the estimate of treatment on the Classroom Discussion Quality Rating ($TREAT_j = 0.293, p < 0.001$). The middle column (*c path*) presents estimates of the treatment effect on a model predicting students' self-reported civic engagement. The third column (*b and c prime path*) displays a model with the estimated impact of Classroom Discussion Quality Rating on students' self-reported civic engagement while controlling for treatment ($DISCUSSION_j = 0.010, n.s.$). The non-significant indirect effect does not support the hypothesis that classroom

discussion mediates the relationship between students' participation in the program and their self-reported civic engagement.

Table 16. Estimates of A, C, and C Prime Paths Used to Calculate Mediated Effects of Program Participation on Civic Engagement

Outcome	<i>a</i> path	<i>c</i> path	<i>b</i> and <i>c'</i> path
	Classroom Discussion Quality Rating	Civic Engagement	Civic Engagement
Treatment	0.293 ** (0.112)	0.075 * (0.030)	0.149 *** (0.032)
Classroom Discussion Quality Rating			0.010 (0.032)
Intercept	-0.046 (0.112)	-0.102 (0.070)	-0.153 (0.102)
Level 2 Variance (Teaching Team)		0.102 (0.022)	0.071 (0.021)
Residual		0.900 (0.009)	0.859 (0.009)
<i>N</i>	5,082	5,082	5,082

Note: Standard errors in parentheses; Each model includes all relevant demographic and political covariates; ⁺ $p < 0.10$ * $p < 0.05$; ** $p < 0.01$, *** $p < 0.001$.

CHAPTER 4: DISCUSSION

Increasingly concerned about the national declines in civic engagement among adolescents, experts in the civic education field have been looking for innovative ways of connecting students with their school, community, and beyond (Carnegie & CIRCLE, 2003). Whereas past evaluations found that comprehensively designed curricula incorporating a broad range of civic activities can improve students' civic engagement (Feldman et al., 2007; McDevitt & Chaffee, 2002), a modest intervention primarily focused on literacy development can achieve similar goals. Trained observers generally found higher levels of classroom discussion quality in classrooms using the WG program in comparison with those in control schools. More importantly, this study provides support for the central research question that participating in the WG program was effective in improving student's self-reported civic engagement, though not for voting interest. These findings are particularly noteworthy because program effects were supported in the context of a randomized trial. Further exploration of these treatment effects indicate that certain ethnic/racial groups did not gain additional benefits. Finally, the study found that program effects were not mediated by classroom discussion. This section provides implications on how the findings from this study contribute to relevant theories and research.

This study found that implementing the WG program led to more active and enriching discussions in classrooms than those in the control schools. These findings are consistent with past evaluations of the WG program randomized trial used in school sites located in the Northeast states (Lawrence et al., *under review*). Although various researchers expressed concerns that teachers and students may be hesitant to disrupt the pattern of IRE commonly found in classrooms (Cotton, 2006; Washington & Humphries, 2012), these findings provide promising evidence that modest school support of an issues-centered curricula can make a

difference in improving classroom discussion quality. Past evaluations on issues-centered curricula have not examined whether classrooms using controversial issues can improve discussion quality (Root et al., 2007; McDevitt & Chaffee, 2000; Syvertsen et al, 2009). This study analyzed classroom observation data from trained observers who rated discussion quality on a number of standardized rubrics. From the students' perspectives, a majority of treatment students reported having interest in discussing controversial issues. These students were more likely to report seeing teachers using these topics during classroom discussion. This study supports evidence that modest curriculum support of the WG program can help improve classroom discussion quality.

Results from the study support past research showing that students identified as Hispanic and Asian are less inclined to engage in civic activities (CIRCLE, 2007). These findings affirm the need to help youth from these population improve their exposure to civic learning opportunities. Fortunately, there is support for the central research question that the WG program can improve students' self-reported civic engagement. The WG program instructs students to engage in classroom activities that builds on learning and engaging in discussions of controversial issues. Controversial issues play a critical role in informing adolescents about pressing issues that are relevant to their communities and beyond (The National Council for the Social Studies, 2007). Although the WG program does not explicitly support or provide students with community action tools to address social issues, the program exposes students to controversial issues on a daily basis that helps them develop social awareness. In turn, these program activities can help students build confidence in their capacity to become active citizens. One explanation is that controversial issues have a mobilizing function that not only helps

students understand the significance, but the procedural knowledge associated with taking actions to resolve the community issue (McLeod & Scheufele, 2000; Scheufele, 2002).

Despite positive findings on the WG program's impact on civic engagement, the program does not seem to have any impacts on students' voting interest. Designed for high school social studies courses, the Student Voices (Pasek et al., 2008) and Kids Vote (McDevitt & Kiouisis, 2006) program were found to be quite effective in improving students' voting interest. However, this finding was not evident in regards to the WG program. Improving voting interest may be more feasible with older (high school students), and less so with younger adolescents (middle school students). According to Hooghe and Wilkenfeld (2008), older adolescents are closer to the legal voting age and more likely to receive concrete information about voting registration procedures in their social studies courses. Despite being enrolled in the WG program, students may not be aware of when and where to vote because voting registration procedures are not usually communicated until high school (Callahan, Muller, & Schiller, 2008). One of the controversial topics covered in the WG program relates to a debate on whether voting should be compulsory in local and national elections. Although students have opportunities to consider various perspectives in debating this topic, it is uncertain whether these discussions encourage students to consider voting as either a choice or mandatory aspect of their civic duty. Nonetheless, this finding considers how the WG program may be limited in its capacity to improve students' voting interest.

Although the WG program was found to have positive effects on students' self-reported civic engagement, students from particular ethnic/racial minority backgrounds do not gain additional benefits in comparison with their Caucasian counterparts. This non-significant finding should not be interpreted to suggest that the program does not work for students from diverse

backgrounds (Huey & Polo, 2008; Miranda et al., 2005). Rather, these results suggest that the WG program may have equally positive effects on students identified as ethnic/racial minorities and Caucasian (Lochman & Wells, 2003). However, these findings suggest possible modifications to ensure that the WG program is more culturally adaptive to fit the learning needs of ethnic/racial minorities (Huey & Polo, 2008). The WG program has been adopted in many urban areas that feature a racially diverse student population; thus, more research is needed to examine how the WG program can address the needs of students with varying perceptions of citizenship (Stepick & Stepick, 2008), language and discourse styles (Levinson, 2012), and frequent use of social media (Kellner & Share, 2005). Also, it is possible that ethnic minority students may be benefitting in other ways that are not captured by this study's current civic engagement items. For example, Hispanic youth may also perceive civic engagement as taking care of family members and participating in cultural groups (Sanchez-Jankowski, 2002).

Finally, the study did not find that program effects on students' self-reported civic engagement operated through classroom discussion. This study considers three possible interpretations in light of these results: (1) program effects may not be mediated by classroom discussion (2) the analysis may be too underpowered to detect a mediation effect¹² or (3) a combination of both these possibilities. Given these possibilities, the study's non-significant findings does not reject past findings on the important relationship between students' exposure to classroom opportunities to discuss controversial issues and their civic engagement (Campbell, 2007). Although trained classroom observers may provide a more robust measure of classroom discussion than students' perceptions, a well-powered study that includes a balanced sampling of content-area classrooms is necessary to understand how improved classroom discussion (at the

teaching team level) may explain observed effects on students' self-reported civic engagement. Thus, the study suggests caution in interpreting how the WG program's feature of classroom discussion is related to students' civic engagement.

Although past studies indicate that issues-centered curricula specifically designed to improve students' civic engagement have been quite successful (Feldman et al., 2007; Lin, 2013), the findings in this study suggest that an intervention focused on literacy development can attain similar results. In contrast to these curricula, the WG program is a more modest intervention that combines learning controversial issues in all content areas, rather than limiting instructions to social studies. These findings are also promising given that most issues-centered curricula require teachers to engage students in participatory activities that extend beyond classroom discussion, such as community service learning, mock voting/legislative procedures, proposal planning, and role-play/simulation (Bennett, Simon, & Xenos, 2002; Lin, 2013). Requiring schools to consider supporting these activities can be quite expensive in regards to providing content and resources (e.g. civics content booklets, and in-class computer terminals), as well as extensive teacher professional development support (Lin, 2013). This study provides evidence that a relatively modest intervention requiring 15 minutes of daily classroom instructions and activities can be quite effective in improving students' self-reported civic engagement.

Limitations

Although the WG program was observed to have a number of positive outcomes on students' self-reported civic engagement, several limitations in this study are addressed. First, pre-test surveys were not administered to students. Pre-test data is useful in understanding

¹² It is important for researchers to not place too much emphasis on non-significant mediation results when studies are underpowered. (Fritz, Cox, & MacKinnon, 2013). Sample sizes of approximately 500 are necessary to detect small effects for

students' self-reported civic engagement at baseline, while also providing more precise treatment effects. The study was also limited to examining a broad civic engagement measure that lacks specificity on whether students participated in certain civic activities, such as contacting public officials, donating money for specific causes, and volunteering in community services (e.g. soup kitchen). Additionally, there are certain civic engagement measures that may better capture the experiences of ethnic/racial minority adolescents, such as taking care of family member and joining cultural groups (Sanchez-Jankowski, 2002).

The study relied on students' self-reported civic engagement. Although students' self-reported civic engagement are considered modestly reliable predictors of their future behaviors (Kahne et al., 2008; Oesterle, Johnson, & Mortimer, 2004), it is still possible that students may inaccurately report their civic engagement (McDevitt & Kiouisis, 2006). Students may be overconfident in how often they help their communities because of social desirability or trying to appear as good citizens (Bouffard-Bouchard, Parent, & Larivee, 1991). Finally, there are other instruments that can be used to assess a broad range of civic outcomes. For example, students' civic knowledge can be tested using a similar assessment used in past evaluations of issues-centered curricula (Syvertsen et al., 2009; Feldman et al., 2007). The civic knowledge assessment is a battery of 40+ factual knowledge items that tests whether students know how a bill becomes a law and the three branches of government. Addressing these limitations are critical to estimating more precise treatment effects as well as improving the generalizability of this study's findings.

Future Research

Although WG program was found to improve students' self-reported civic engagement, questions remain on what aspects of the program is particularly engaging and effective for

both the X to M and X to Y adjusted for M relations. (MacKinnon, 2012).

students. One suggestion is to conduct interviews with students who participated in the WG program. The first inquiry is to gain closer examinations of *how* students engage in certain civic activities, which consists of understanding the types (e.g. volunteering and mentoring), frequency (daily, week, or monthly), and for what purposes (e.g. health, academic, environment, and social). Interviewing students may also clarify what makes the WG program engaging, in particular to exploring questions, such as: (1) Are there certain topics that are more relevant to students' experiences?; (2) In what ways do students extend discussions of controversial issues with their peers outside of class?; and (3) How does the WG program push students to think about their roles in societies—as deliberators, planners and/or active participants in resolving certain social issues? (Voight & Torney-Purta, 2013). Answers to these questions are critical to providing more perspectives on the possible interactions between students' experience with the WG program and their family and community context.

A follow-up study also seems to be the next logical step in assessing the long-term effects of the WG program. Students can be tracked four to ten years after participating in the study and asked to provide information regarding whether they voted during local, state, and national elections. Another use of this data is to measure whether their reported interest from the current study is consistent with their actual behavior outcomes of engaging in civic activities. Another line of inquiry in using this data is to consider the degree that WG program participants are likely to identify with certain political parties, ideals, and causes. These inquiries will help assess the long-term effects of the WG program. Also, a longitudinal study will provide important insights on developing reliable instruments that can be used across a number of developmental stages to measure civic engagement among young people.

The last inquiry is to consider how extensions or improvements to the WG curriculum may potentially extend treatment effects. The WG program is certainly a viable candidate of benefiting from additional learning supports, such as media and technology extensions (Feldman et al., 2007), community-service planning (Vontz & Nixon, 1999), and support to engage parents in facilitating discussions at home (McDevitt & Canton-Rosser, 2009). Expanding research in these critical areas is important to developing comprehensive assessments and teaching tools that will help schools effectively use controversial issues as a basis for classroom instructions and discussions.

Conclusion

In summary, the study provides evidence that exposing students to learning and discussing controversial issues through the WG program can positively impact students' self-reported civic engagement. Civic engagement is important for adolescents in the broad context of developing awareness and responsibility of improving the community, as well as eventually fulfilling one's civic duty to participate and vote in the national elections (Althof & Berkowitz, 2006; Carnegie Corporation & CIRCLE, 2003). An understated importance of civic engagement relates to how adolescents can establish positive school identities, which may lead to less behavioral problems and improved learning outcomes (Lin, 2013; Torney-Purta et al., 2007). This study makes a number of contributions that inform how schools can develop teaching strategies and curricula content used to improve students' civic engagement.

The WG program presents a broad range of controversial issues in various subject area contexts on a daily basis that can help students develop awareness of social issues relevant to their communities. Students learn about controversial issues through a variety of instructional activities related to reading, writing, and having interpersonal discussions in class. This study

reveals that curricula emphasis on controversial issues can improve classroom discussion quality, which can be an engaging experience for students and teachers (Browning et al., 2004). The strength of these findings is highlighted by using observation data from trained observers who rated discussion quality based on a number of standardized rubrics. Further, treatment effects were estimated after taking into account a number of demographic and political characteristics. Although past studies based on quasi-experimental evaluations report that issues-centered curricula can improve students' civic engagement (Pasek et al., 2008; Syvertsen et al., 2009), this study shows that the WG program can also improve civic engagement in the context of a randomized design.

At this point, issues-centered curricula have been exclusively designed for social studies courses and shown to have generally positive impacts on students' civic engagement (Kahne et al., 2006; Lin, 2013; Root et al., 2007). This study, however, suggest that similar results can be achieved through a literacy intervention oriented towards middle school students. The WG program may be an appealing alternative for schools to consider because the program is freely available and requires a modest level of teacher professional development. This study adds evidence to a growing body of research documenting the benefits of the WG program, which includes improvements in students' academic vocabulary (Lawrence et al., 2011), communicative self-efficacy (Lin et al., *under review*), and writing outcomes (Mancilla-Martinez, 2010).

A serious concern is that students enrolled in diverse and urban school districts have fewer opportunities to practice civic activities in comparison with students enrolled in more privileged schools (CIRCLE, 2013; Kawashima-Ginsberg & Levine, 2014). For example, schools located in high poverty areas have fewer opportunities for service learning and

community service outreach (Hart & Atkins, 2002; Kahne, Middaugh, & Schutjer-Mance, 2005). One reason explaining the low civic learning opportunities is that school administrators are constantly pressured to ensure that students excel on standardized math and ELA assessments, which leaves less attention to improving social studies courses (Burroughs, Groce, & Webeck, 2005). This finding is relevant given that social studies teachers devote the most attention and effort to helping students' develop civic engagement in comparison with other content area teachers (Levine & Lopez, 2004). The current study reports that ELA, science and math teachers can also share in the responsibility of helping students to becoming informed and active citizens. Indeed, the implications of this study suggest that the lack of civic learning opportunities in highly diverse urban school districts can be addressed by considering a modest intervention requiring a small amount of instructional time and resources.

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APPENDIX

Table 17. Ethnic/Racial Makeup of Grade Levels from 6th to 8th Grade in Participating Schools

	Grade 6						Grade 7						Grade 8					
	White %	Black %	Asian %	SE Asian %	Hispanic %	Other %	White %	Black %	Asian %	SE Asian %	Hispanic %	Other %	White %	Black %	Asian %	SE Asian %	Hispanic %	Other %
Control																		
Duffie Oak	0.0%	4.3%	51.4%	2.2%	37.7%	2.2%	5.4%	3.6%	53.6%	1.8%	33.9%	1.8%	0.8%	3.0%	59.1%	3.0%	31.1%	1.5%
Evergreen							0.0%	22.2%	0.0%	0.0%	44.4%	11.1%	4.0%	20.0%	8.0%	0.0%	60.0%	8.0%
Honeysuckle	2.9%	2.9%	58.6%	4.3%	27.1%	1.4%	8.7%	5.8%	51.5%	3.9%	23.3%	5.8%	10.6%	6.0%	58.8%	3.0%	18.6%	2.0%
Maple	8.6%	4.3%	72.9%	4.3%	8.6%	0.0%	5.1%	8.7%	60.7%	6.6%	16.8%	3.6%	4.8%	5.3%	74.9%	6.8%	8.7%	2.4%
Rosemary	14.3%	2.0%	55.1%	8.2%	14.3%	8.2%	9.5%	7.0%	57.8%	4.0%	11.1%	5.0%	7.0%	4.9%	72.4%	9.7%	6.5%	5.4%
Vineland	5.0%	25.0%	23.3%	3.3%	33.3%	3.3%	1.6%	9.8%	39.3%	3.3%	36.1%	0.0%	1.1%	17.0%	56.8%	6.8%	15.9%	4.5%
TOTAL	7.5%	7.5%	52.5%	6.4%	23.8%	2.7%	7.3%	8.5%	52.6%	4.2%	20.7%	3.8%	5.5%	6.7%	63.7%	5.7%	16.9%	3.0%
Treatment																		
Apple	11.9%	3.2%	62.8%	3.9%	9.5%	5.6%	9.9%	3.6%	61.9%	4.8%	9.0%	8.1%	7.5%	5.9%	65.3%	4.4%	9.1%	5.6%
Arbola	13.3%	9.5%	32.2%	1.9%	33.2%	4.3%	15.1%	6.2%	41.8%	0.9%	24.9%	5.8%	7.5%	5.9%	39.3%	3.8%	36.8%	3.3%
Flower Square	3.8%	7.6%	66.7%	3.8%	12.4%	1.9%	8.7%	8.7%	65.2%	2.9%	10.1%	4.3%	3.4%	12.6%	69.0%	2.3%	11.5%	1.1%
Hemlock	7.4%	0.0%	0.0%	0.0%	79.6%	7.4%	1.8%	10.5%	3.5%	1.8%	77.2%	0.0%	0.0%	18.6%	2.3%	0.0%	74.4%	2.3%
Moon	0.0%	11.9%	61.0%	11.9%	18.6%	3.4%	0.8%	15.9%	54.8%	8.7%	19.8%	2.4%	0.9%	8.5%	58.5%	9.4%	19.8%	4.7%
Palm	13.9%	7.2%	57.4%	4.0%	9.4%	4.9%	18.4%	2.3%	52.9%	3.9%	9.4%	4.5%	15.1%	4.0%	55.5%	1.8%	7.7%	6.6%
TOTAL	10.7%	6.4%	51.0%	3.7%	19.9%	4.9%	12.0%	5.9%	51.5%	3.9%	17.1%	5.3%	8.2%	7.0%	53.8%	3.7%	18.8%	4.8%

Note. Heterogeneous classrooms categorized as having at least 15% of students in three or more ethnic/racial groups (in bold).

Table 18. 2007-2009 Demographic and Academic Characteristic of Participating Schools Prior to the Randomized Trial

Cluster	Treatment Condition	School	Enrollment	% FARM	% Proficient ELA (2007)	% Proficient ELA (2008)	% Proficient ELA (2009)	% Proficient MATH (2007)	% Proficient MATH (2008)	% Proficient MATH (2009)	Avg Scaled Score ELA (2008)	Avg Scaled Score ELA (2009)	Avg Scaled Score Math (2008)	Avg Scaled Score Math (2009)	Percent Factor	Scaled Factor
1	TREATMENT	Hemlock	330	77	19	21	27	9	13	21	310.10	320.12	289.91	295.50	-1.39	-1.30
1	CONTROL	Evergreen	427	73	19	18	19	14	18	16	301.15	305.70	295.06	300.68	-1.37	-1.31
2	CONTROL	Vineland	306	73	31	30	36	28	30	27	317.29	324.21	312.88	311.04	-0.85	-1.01
2	TREATMENT	Flower Square	699	83	25	25	25	30	35	45	307.73	309.73	352.21	352.81	-0.77	-0.70
3	CONTROL	Duffie Oak	580	68	34	34	36	27	34	31	330.09	332.13	323.01	330.28	-0.60	-0.52
3	TREATMENT	Jasmine	572	62	34	34	40	34	37	40	332.47	340.36	323.57	332.95	-0.40	-0.37
4	TREATMENT	Moon	500	73	39	38	43	42	40	40	334.90	336.74	325.43	331.92	-0.35	-0.54
4	CONTROL	Maple	941	79	52	50	48	53	54	58	349.16	349.98	372.01	378.43	0.30	0.26
5	TREATMENT	Arbola	988	55	52	57	67	50	60	66	361.22	377.81	373.81	381.74	0.77	0.86
5	CONTROL	Rosemary	723	74	61	62	69	67	76	78	364.80	374.99	402.04	418.01	0.95	0.79
6	CONTROL	Honeysuckle	1,205	45	63	63	69	51	54	61	368.29	376.88	367.10	369.18	1.02	1.06
6	TREATMENT	Apple	1,207	51	67	70	71	67	63	71	376.43	379.39	395.64	398.79	1.31	1.33
7	TREATMENT	Palm	1,183	46	66	69	74	66	67	72	374.13	381.26	405.62	405.33	1.37	1.44

Note: T-tests indicate that clusters did not differ on each demographic and academic measure; Jasmine did not provide relevant data for the current study

Table 19. Response Rates of the Civic Engagement and Voting Interest Items

	All	CE Item: Helping the poor?		Civic Engagement Scaled Score		Voting Interest	
	<i>N</i>	<i>n</i>	% Contributed	<i>n</i>	% Contributed	<i>n</i>	% Contributed
Control							
Duffie Oak	497	335	67.4%	352	70.8%	346	69.6%
Evergreen	235	112	47.7%	111	47.2%	104	44.3%
Honeysuckle	836	443	53.0%	436	52.2%	419	50.1%
Maple	684	666	97.4%	667	97.5%	663	96.9%
Rosemary	442	439	99.3%	438	99.1%	436	98.6%
Vineland	299	296	99.0%	294	98.3%	292	97.7%
Total	2,993	2,291	76.5%	2,298	76.8%	2,260	75.5%
Treatment							
Apple	1,083	1,055	97.4%	1,052	97.1%	1,048	96.8%
Arbola	850	763	89.8%	756	88.9%	743	87.4%
Flower Square	330	281	85.2%	280	84.8%	274	83.0%
Hemlock	170	165	97.1%	163	95.9%	160	94.1%
Moon	427	357	83.6%	355	83.1%	344	80.6%
Palm	1,027	886	86.3%	882	85.9%	873	85.0%
Total	3,887	3,507	90.2%	3,488	89.7%	3,442	88.6%
District Total	6,880	5,798	67.6%	5,786	84.1%	5,702	82.9%

Note: CE = Civic Engagement; Civic engagement is a scaled score based on a three-item measure relating to students' reported frequency of helping their friend, school, and community on a Likert scale of 1 "rarely" to 5 "always"; Voting interest is a single item measure that reflect interest in voting when student reaches legal age on a scale of 1 "not at all interested" to "extremely interested";

Table 20. *Students' Pretest and Posttest Reading Comprehension Scores Comparing Across Treatment Status*

	All Schools			Control Schools				Word Generation Schools				Pooled Standard Deviation	$\delta T - \delta C$	Effect Size Calculated
	<i>n</i>	Pretest	Posttest	<i>n</i>	Pretest	Posttest	δC	<i>n</i>	Pretest	Posttest	δT			
6th Graders	1,706	507.7 (34.7)	515.9 (39.8)	592	498.1 (33.7)	504.4 (38.9)	6.31	1,114	512.8 (34.1)	522.0 (38.9)	9.25	34.56	2.94	0.09
7th Graders	1,581	528.3 (36.6)	534.2 (40.9)	450	523.1 (36.7)	528.3 (40.9)	5.20	1,131	530.4 (36.4)	536.6 (40.7)	6.13	36.20	0.92	0.03
8th Graders	1,710	543.3 (39.8)	546.5 (41.6)	665	536.8 (39.2)	544.2 (42.3)	7.45	1,045	547.5 (39.7)	548.0 (41.2)	0.50	39.60	-6.95	-0.18

Table 21. Workbook Completion Rate by Week in Each Treatment School (Total 24)

	Apple	Arbola	Flower Square	Hemlock	Palm	Moon	Overall
	<i>M</i>	<i>M</i>	<i>M</i>	<i>M</i>	<i>M</i>	<i>M</i>	<i>M</i>
WEEK 1	0.92	0.80	0.82	0.84	0.87	0.69	0.82
WEEK 2	0.92	0.74	0.74	0.82	0.80	0.64	0.77
WEEK 3	0.90	0.72	0.79	0.84	0.84	0.64	0.78
WEEK 4	0.93	0.69	0.49	0.84	0.85	0.64	0.73
WEEK 5	0.93	0.70	0.69	0.82	0.87	0.66	0.77
WEEK 6	0.92	0.69	0.65	0.82	0.81	0.65	0.74
WEEK 7	0.90	0.73	0.67	0.84	0.82	0.66	0.76
WEEK 8	0.93	0.67	0.85	0.82	0.83	0.67	0.77
WEEK 9	0.93	0.64	0.55	0.73	0.82	0.71	0.72
WEEK 10	0.90	0.55	0.59	0.66	0.82	0.58	0.68
WEEK 11	0.84	0.65	0.62	0.75	0.80	0.36	0.68
WEEK 12	0.92	0.56	0.64	0.68	0.83	0.60	0.69
WEEK 13	0.90	0.60	0.38	0.89	0.75	0.49	0.65
WEEK 14	0.89	0.59	0.35	0.91	0.74	0.47	0.63
WEEK 15	0.90	0.61	0.12	0.84	0.70	0.45	0.59
WEEK 16	0.88	0.60	0.23	0.82	0.73	0.40	0.60
WEEK 17	0.89	0.59	0.09	0.86	0.72	0.40	0.58
WEEK 18	0.88	0.57	0.12	0.86	0.75	0.41	0.59
WEEK 19	0.88	0.57	0.27	0.89	0.74	0.45	0.61
WEEK 20	0.88	0.56	0.32	0.89	0.74	0.47	0.62
WEEK 21	0.89	0.59	0.21	0.89	0.72	0.36	0.59
WEEK 22	0.89	0.54	0.25	0.89	0.73	0.46	0.60
WEEK 23	0.88	0.56	0.09	0.68	0.71	0.34	0.55
WEEK 24	0.88	0.53	0.14	0.91	0.71	0.39	0.57

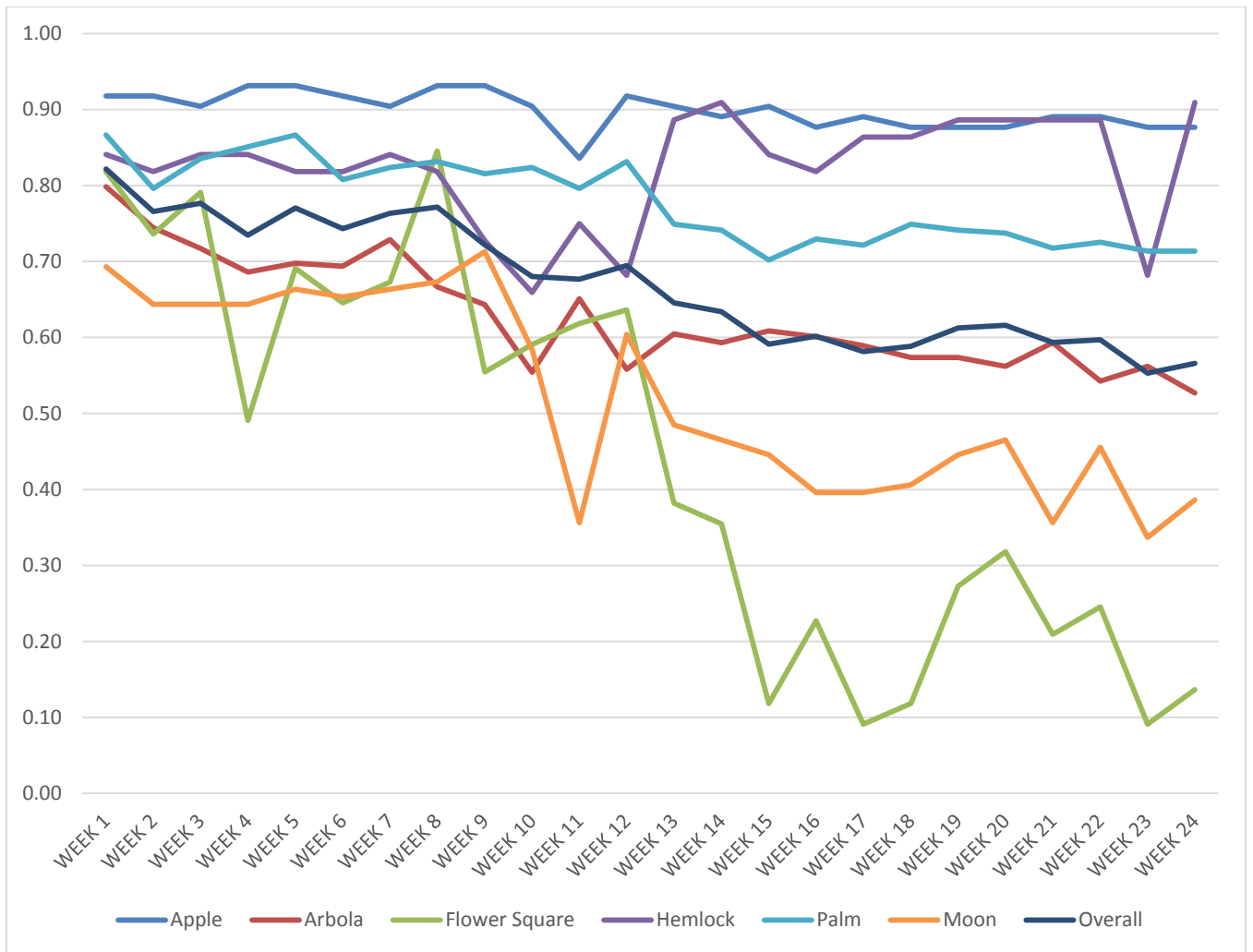


Figure 8. Student Workbook Completion Per School

Table 22. General Measure of Fidelity Scores in Each Content Area Across Schools

ELA	Apple			Arbola			Flower Square			Hemlock			Moon			Palm			Overall		
	YES	TOTAL	%	YES	TOTAL	%	YES	TOTAL	%	YES	TOTAL	%	YES	TOTAL	%	YES	TOTAL	%	YES	TOTAL	%
The routine for launching the Day 1 Activity appeared smooth and efficient	4	4	1.00	2	2	1.00	2	2	1.00	4	4	1.00	3	4	0.75	4	4	1.00	19	20	0.95
Teacher had his/her WG workbook	4	4	1.00	1	2	0.50	2	2	1.00	3	4	0.75	4	4	1.00	4	4	1.00	18	20	0.90
All students had their WG workbooks	4	4	1.00	1	2	0.50	2	2	1.00	3	4	0.75	3	4	0.75	2	3	0.67	15	19	0.79
MATH																					
The routine for launching the Day 1 Activity appeared smooth and efficient	3	4	0.75	2	2	1.00	1	2	0.50	0	3	0.00	3	4	0.75	4	4	1.00	13	19	0.68
Teacher had his/her WG workbook	3	4	0.75	2	2	1.00	2	2	1.00	2	3	0.67	4	4	1.00	4	4	1.00	17	19	0.89
All students had their WG workbooks	2	2	1.00	2	2	1.00	2	2	1.00	1	2	0.50	1	4	0.25	4	4	1.00	12	16	0.75
SCIENCE																					
The routine for launching the Day 1 Activity appeared smooth and efficient	2	4	0.50	2	2	1.00	2	2	1.00	0	2	0.00	3	4	0.75	4	4	1.00	13	18	0.72
Teacher had his/her WG workbook	4	4	1.00	2	2	1.00	2	2	1.00	2	2	1.00	1	4	0.25	4	4	1.00	15	18	0.83
All students had their WG workbooks	4	4	1.00	2	2	1.00	2	2	1.00	2	2	1.00	1	3	0.33	2	4	0.50	13	17	0.76
SOCIAL STUDIES																					
The routine for launching the Day 1 Activity appeared smooth and efficient	4	4	1.00	2	2	1.00	1	2	0.50	2	4	0.50	1	3	0.33	4	4	1.00	14	19	0.74
Teacher had his/her WG workbook	2	2	1.00	2	2	1.00	2	2	1.00	4	4	1.00	2	4	0.50	2	4	0.50	14	18	0.78
All students had their WG workbooks	4	4	1.00	1	2	0.50	2	2	1.00	4	4	1.00	2	2	1.00	3	4	0.75	16	18	0.89

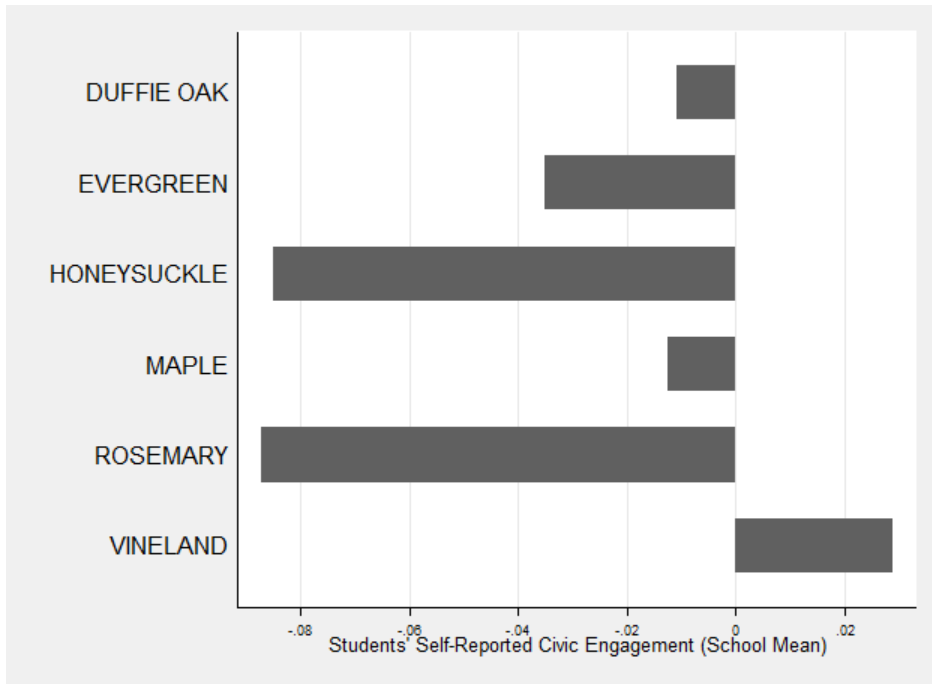
Table 24. Content Area Specific Fidelity Measure Across Each School

ELA	Apple			Arbola			Flower Square			Hemlock			Moon			Palm			Overall		
	YES	TOTAL	%	YES	TOTAL	%	YES	TOTAL	%	YES	TOTAL	%	YES	TOTAL	%	YES	TOTAL	%	YES	TOTAL	%
Teacher target word posted on chart	2	4	0.50	1	2	0.50	1	2	0.50	3	4	0.75	2	4	0.50	4	4	1.00	13	20	0.65
Teacher introduced question	3	4	0.75	1	2	0.50	2	2	1.00	0	4	0.00	3	4	0.75	2	4	0.50	11	20	0.55
Teacher provided context	3	4	0.75	1	2	0.50	1	2	0.50	2	4	0.50	3	4	0.75	0	4	0.00	10	20	0.50
Teacher modeled comprehension strategies	3	4	0.75	1	2	0.50	1	2	0.50	2	4	0.50	0	4	0.00	1	4	0.25	8	20	0.40
Teacher apply comprehension strategies	2	4	0.50	0	2	0.00	1	2	0.50	2	4	0.50	0	4	0.00	0	4	0.00	5	20	0.25
Teacher all comprehension questions addressed	2	4	0.50	0	2	0.00	0	2	0.00	0	3	0.00	0	0	0.00	3	4	0.75	5	15	0.33
Teacher posed questions beyond WG	2	4	0.50	1	2	0.50	1	2	0.50	2	3	0.67	3	4	0.75	1	2	0.50	10	17	0.59
Teacher students used words to learn meaning	3	4	0.75	1	2	0.50	1	2	0.50	3	4	0.75	2	4	0.50	1	4	0.25	11	20	0.55
Overall	20	32	0.63	6	16	0.38	8	16	0.50	14	30	0.47	13	28	0.46	12	30	0.40	73	152	0.48
MATH																					
Problem was read aloud and students were able to see the text while listening	1	3	0.33	1	2	0.50	2	2	1.00	1	2	0.50	0	4	0.00	3	4	0.75	8	17	0.47
Teacher asked students to explain the mathematical strategies to solve the problem	2	3	0.67	1	2	0.50	1	2	0.50	1	2	0.50	2	4	0.50	2	3	0.67	9	16	0.56
Teacher modeled the mathematical strategies to solve the problem	2	3	0.67	0	2	0.00	0	2	0.00	0	2	0.00	0	4	0.00	1	4	0.25	3	17	0.18
All components of the mathematical problems were addressed during the lesson	3	4	0.75	0	2	0.00	2	2	1.00	1	1	1.00	0	4	0.00	2	4	0.50	8	17	0.47
Overall	8	13	0.62	2	8	0.25	5	8	0.63	3	7	0.43	2	16	0.13	8	15	0.53	28	67	0.42
SCIENCE																					
Problem was read aloud and students were able to see the text while listening	0	4	0.00	1	2	0.50	0	2	0.00	0	2	0.00	1	4	0.25	1	4	0.25	3	18	0.17
Students were given time to analyze data in small group	0	4	0.00	1	2	0.50	1	2	0.50	0	2	0.00	0	4	0.00	1	4	0.25	3	18	0.17
Teacher modeled how to analyze data	0	4	0.00	1	2	0.50	0	2	0.00	0	2	0.00	3	4	0.75	0	4	0.00	4	18	0.22
Teachers asked students whether their hypothesis was correct or incorrect AND asked for evidence to support their conclusions	2	4	0.50	0	1	0.00	2	2	1.00	1	2	0.50	2	4	0.50	1	4	0.25	8	17	0.47
Overall	2	16	0.13	3	7	0.43	3	8	0.38	1	8	0.13	6	16	0.38	3	16	0.19	18	71	0.25
SOCIAL STUDIES																					
Their were norms for debating and students abided by them	1	4	0.25	2	2	1.00	0	2	0.00	2	4	0.50	0	2	0.00	1	4	0.25	6	18	0.33
The teachers reminded students that they must provide reasons to support their positions during the debate	1	4	0.25	0	2	0.00	1	2	0.50	2	4	0.50	0	2	0.00	2	4	0.50	6	18	0.33
A range of positions were represented in the debate,not just the extreme positions	3	4	0.75	2	2	1.00	0	2	0.00	2	4	0.50	2	2	1.00	2	4	0.50	11	18	0.61
Students listened to each others' contributions during the debate	3	4	0.75	2	2	1.00	1	2	0.50	2	4	0.50	1	2	0.50	2	4	0.50	11	18	0.61
Closure was brought to the debate by summarizing the key positions debated	1	4	0.25	0	2	0.00	0	2	0.00	1	4	0.25	0	2	0.00	0	4	0.00	2	18	0.11
Overall	9	20	0.45	6	10	0.60	2	10	0.20	9	20	0.45	3	10	0.30	7	20	0.35	36	90	0.40

Table 25. Comparison of Students' Self-Reported Civic Engagement and Voting Interests (School Mean) by Treatment Status

	Civic Engagement			Voting Interest		
	n	Mean	SD	n	Mean	SD
Treatment Schools						
Apple	1,044	0.06	0.65	1,042	3.14	1.28
Arbola	753	0.01	0.65	748	3.24	1.29
Flower Square	276	-0.02	0.66	273	2.96	1.34
Hemlock	164	-0.16	0.68	163	2.83	1.39
Moon	336	0.02	0.73	335	2.95	1.37
Palm	878	0.09	0.63	874	3.09	1.37
Total	3,451	0.04	0.66	3,435	3.10	1.33
	n	Mean	SD	n	Mean	SD
Control Schools						
Duffie Oak	348	-0.01	0.65	346	3.08	1.29
Evergeen	111	-0.04	0.70	109	2.95	1.40
Honeysuckle	409	-0.09	0.65	409	2.91	1.30
Maple	687	-0.01	0.63	684	3.03	1.38
Rosemary	611	-0.09	0.64	605	3.29	1.26
Vineland	334	0.03	0.71	333	3.16	1.29
Total	2,500	-0.04	0.65	2,486	3.09	1.32

A. Control Schools



B. Treatment Schools

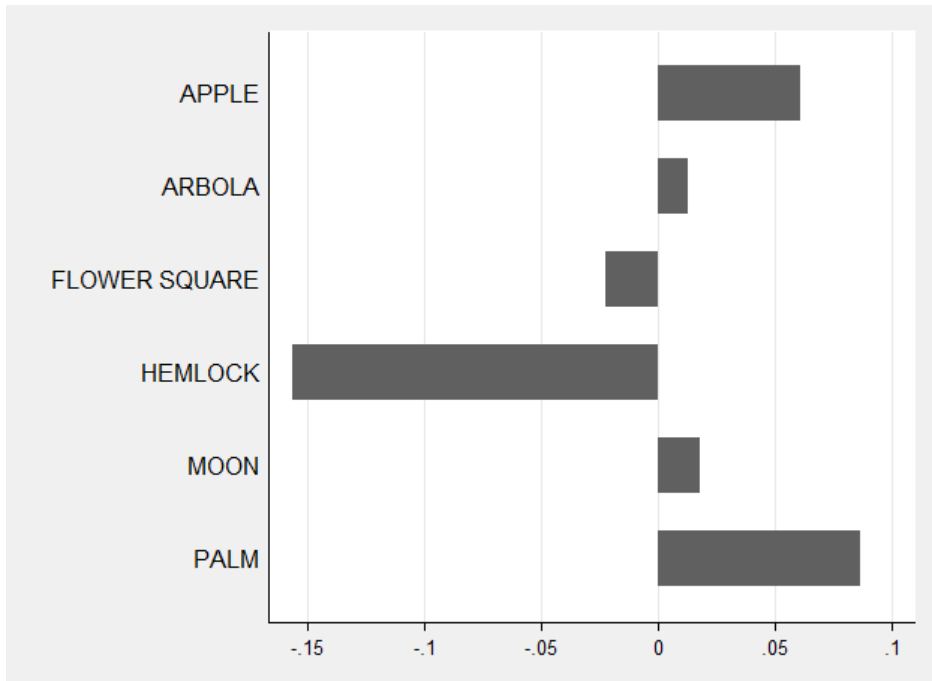


Figure 9. Bar Graphs of Students' Self-Reported Civic Engagement (School Means)

Figure 10. Word Generation Sample Curriculum

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20005

PAGE 1



Join the national conversation!

A collage of three images related to stem cell research: a petri dish with cells, laboratory glassware, and a scientist in a lab coat.

**SHOULD THE GOVERNMENT FUND
STEM CELL RESEARCH?**

Word Generation - Unit 2.07

Focus Words

embryo | paralyzed | theory | investigate | obtain



Weekly Passage

In summer 2003, toddler Kai Harriott of Boston was sitting on her porch, singing with her sister. A gang member shot into the air to scare Kai's neighbors. Kai was hit by a bullet. After being shot, Kai was paralyzed. She could not move from the waist down. Because of her injury, Kai must use a wheelchair. But scientists have an idea that might help. They have a theory that stem cells can someday help people like Kai.

Stem cells are found in different parts of the human body, including in our blood. Stem cells are also found in fertilized human eggs, called embryos. Stem cells from embryos can develop into cells that do many different jobs in the human body. With more research, we may be able to grow replacement parts for humans from stem cells.

If doctors can grow spinal cord cells, people like Kai might walk again. New brain

cells could help people who have had strokes or Alzheimer's disease. Scientists might also learn to grow the cells that make insulin. This could help people with diabetes. But to obtain some stem cells, scientists must destroy a human embryo.

Many people think that human life begins when an egg is fertilized. They think destroying a human embryo is like murder. They say scientists should only work with stem cells from adults. But most scientists find that stem cells taken from adults won't grow into the many different kinds of human cells the way that stem cells from embryos do. Stem cells from embryos may be our only hope of curing some diseases.

Investigating stem cells will take years and cost millions. Should the government pay for stem cell research?

Unit 2.07 Should the government fund stem cell research? Focus Word Chart					
Word	Meaning	Forms	Examples of Use	Notes	
embryo	(n.) - new organism in a mother's womb				
paralyzed	(adj.) - unable to move				
theory	(n.) - an explanation for a set of related facts				
investigate	(v.) - trying to learn about				
obtain	(v.) - to get				

Unit 2.07

Should the government fund stem cell research?

Problem of the Week



President George W. Bush restricted government funding on stem cell research. On August 9, 2001, he said that scientists could not **obtain** federal money for research on embryonic stem cell lines created after that date. This **paralyzed** certain areas of research. Scientists put some scientific **investigations** on hold.

President Bush believed he had a moral duty to stop new **embryos** from being destroyed. Each embryo, he pointed out, is a potential human being. His **theory** was that using embryos for research cheapens human life.

President Obama has a different moral theory. He says human beings have a moral duty to help people who are suffering. Therefore, they should use science to fight disease. In 2009, President Obama lifted President Bush's restrictions.

Option 1: Each embryo needed to start a stem cell line is made up of about 100 cells. Its mass is about one ten-millionth of a gram. Which of the following shows one ten-millionth?

- A) .0001
- B) .00001
- C) .000001
- D) .0000001

Option 2: Each embryo needed to start a stem cell line is made up of about 100 cells. Each person is made up of about 100 trillion cells. Write both numbers in scientific notation. How many orders of magnitude separate the two numbers?

Discussion Question: In 2009, the FDA approved the first clinical trial using **embryonic** stem cells. A company called Geron Corp planned to inject embryonic stem cells into 8-10 people whose legs were **paralyzed** by a spinal cord injury. The Geron scientists had a **theory** that these cells could help repair damaged nerves. **Obtaining** subjects for the trial would take time, because the scientists wanted to inject the cells within a few days of the injury. They said the trial was primarily an **investigation** into whether injecting stem cells would be safe. But they also hoped to see whether the stem cells would help patients recover some movement in their legs.

Pretend that you are against stem cell research. What would you say to these researchers to convince them to give up this project?

Unit 2.07

Should the government fund stem cell research?

Debating the Issue



1. Get ready...

Pick one of these positions (or create your own).

A Scientists should focus on finding cures using adult stems cells instead of stems cells from embryos. There are valid ethical concerns about using embryonic stem cells.

B Destroying an embryo to get the stem cells is like murder. This should be a crime.

C The government should pay for embryonic stem cell research. This could be our only hope for treatment of many injuries and diseases that cause suffering and death.

D Scientists should be allowed to do research on embryonic stem cells, but the government should not pay for it because many taxpayers oppose it.

E _____

GO!

Be a strong participant by using phrases like these.

In my experience . . .

that's similar to what I think too...

What makes you think that?

When I re-read the text, it reminded me...

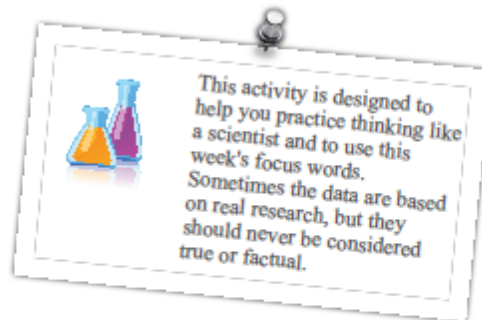
2. Get set...

Be ready to provide evidence to back up your position during your class discussion or debate. Jot down a few quick notes:

Unit 2.07

Should the government fund stem cell research?

Science Activity



Professor Seemy's class is talking about stem cell research.

"I saw a woman on TV who was **paralyzed** in a car accident," says Gabriel. "She said stem cell research could help her walk again."

"I saw a guy on TV who opposes stem cell research," says Toni. "He said that scientists kill babies to **obtain** stem cells."

"That's wrong," says Gabriel. "Scientists get stem cells from **embryos** that grow in a lab. Embryos aren't babies. They're tiny clumps of cells."

"People have strong opinions about stem cell research," says Professor Seemy. "But they may not understand stem cell science. I have a **theory**. I bet most people don't even know what stem cells are. Let's **investigate!**"

Question:

How many people can define "stem cell"?

Hypothesis:

Most people will not know these basic facts about stem cells:

- a. A stem cell is a cell that can become a more specialized cell.
- b. Stem cells become skin, blood, nerve, and muscle cells.
- c. All cells in a person's body come from (or stem from) stem cells.

Materials:

- ▶ 100 adults

Word Generation Sample Curriculum (p.6)

Procedure:

1. Show each adult the 3 statements about stem cells.
2. Ask whether the statements are true or false.
3. Calculate the percentage of right and wrong answers for each question.

Data:

Statement	Right	Wrong
A	60%	40%
B	25%	75%
C	18%	82%

Conclusion:

Is the hypothesis supported or not by the data?

What evidence supports your conclusion?

How would you make this a better experiment?

Figure 11. Word Generation List of Topics

APPENDIX

JOIN THE NATIONAL CONVERSATION - WORD GENERATION WEEKLY TOPICS



SERIES 1	SERIES 2	SERIES 3
 What is the purpose of school?	 Should passing standardized tests be a high school graduation requirement?	 Should ethanol be a place for ethanol?
 Where are the women in math and science?	 Should colleges use Afternoon Admissions?	 Should the use of paper or plastic be an individual choice or be regulated by the government?
 What is an American?	 Health issues in education: What is appropriate for our schools?	 Do the benefits of owning a pet outweigh the potential harm it can cause the animals?
 Claring: Threat or opportunity?	 Do professional athletes deserve multi-million dollar salaries?	 Should adoption information be kept private or made public?
 Does rap music have a negative impact on youth?	 Should students be paid to do well in school?	 Should across texting be legal?
 Racial teasing: Is it necessary?	 Title IX: Preventing discrimination against girls and women in sports and education?	 Should the U.S. keep troops in Iraq?
 Dating: Who should decide what young people read?	 Should the government fund stem cell research?	 Should the government impose a mandatory year of service?
 School stress: What should be done?	 Who is responsible for childhood obesity?	 Should the government regulate genetic testing?
 School stress: What should be done?	 Nuclear power: Can energy firms or states be held liable?	 Should the United States support the development of more biotechnology to genetically modify food?
 School stress: What should be done?	 Should the "Bridge of Apologies" be "enclosed, under lock and key"?	 Considering the possible benefits and risks, is becoming a vegetarian a smart decision?
 School stress: What should be done?	 How should schools prevent bullying?	 Is an extended school day the right choice for middle school students?
 School stress: What should be done?	 Should prisons be allowed to admit only ill inmates with no life?	 Should single-gender education be an option for families or should all public schools be unisex?
 School stress: What should be done?	 Should American students be required to learn a second language?	 Should schools have a vocational track?
 School stress: What should be done?	 Are Ocean Technologies worth the investment?	 Should there be a 16th Prison 2?
 School stress: What should be done?	 Violence and media are strange systems to measure?	 Who is responsible for preventing teen drivers from getting licenses?
 School stress: What should be done?	 Should intelligent design be taught in school?	 Should parents prevent their teens from cyberbullying?
 School stress: What should be done?	 Should drug companies be allowed to advertise prescription drugs on television?	 Should insurance be allowed as a medical treatment?
 School stress: What should be done?	 Should testing for competitiveness in local and national elections in the United States?	 How should doctors choose recipients for organ transplants?
 School stress: What should be done?	 Should there be amnesty for war criminals serving in Iraq?	 Should the use of nicotine in youth be regulated?
 School stress: What should be done?	 Should tropical paradises be an option for families as well as in school?	 Should hangover on flag?
 School stress: What should be done?	 Should middle and high school students have an honor grade requirement to go to college in states?	 Should people be able to trademark phrases?
 School stress: What should be done?	 Are after-school jobs helpful or harmful for middle and high school students?	 If you were a parent, would you buy a doll that encourages gender violence?
 School stress: What should be done?	 Should middle and high schools use academic trading?	 Should shopping malls be allowed to exclude teen customers?
 School stress: What should be done?		 Should it be mandatory to get a license to be a parent?

Figure 12. Parent/Student Study Information Sheet



Assistant Superintendent, Middle Schools
 Leadership, Equity, Achievement and Design (LEAD)

555 Franklin St • San Francisco, CA 94102 • Tel: (415) 241-6607 • Fax: (415) 241-6632 • Email: [Redacted]

August 2011

Dear Parents/Caregivers:

I am happy to announce that some schools in our district are continuing to participate in a study about a new vocabulary program called Word Generation. Word Generation introduces students to five academic vocabulary words each week and students learn about a topic of general interest at the same time they learn how to recognize the words and write and speak about the topic using the words. Your child's school may or may not be starting the program right away, but all schools will get the program for free if our district shares some student data with the Word Generation team in preparation for participating in the program.

For students who participate in the research:

- The school will share academic information with the researchers.
- The students will take some vocabulary and reading tests at the beginning and end of the year.
- They may participate in the Word Generation curriculum

For students who do not participate in the research:

- They will participate in study related activities however, no information about them will be included in the analyses.

Whether or not you choose to have your child's work included in the study will not affect your child's grade, or you or your child's relationship with the teacher and school, in any way. You may change your mind about your child's participation at any time.

Some classes will be videoed so the researchers can understand the program in action. All video, picture, voice, or student identifying information (like name) will be used only by researchers and kept private and confidential. If your permission is not given for videotaping, your child will not be videotaped.

If you have any questions about this research please feel free to contact [Redacted], Strategic Education Research Partnership (SERP) at [Redacted], ext. 1036.

- If you give permission for your child to participate in the research described above and if you give permission for your child to be videoed during one or two class periods then you do not need to return this form.
- If you do NOT give permission for your child to participate in the research and/or to be videotaped during one or two class periods then please complete the form below and return it by **September 2, 2011**.

Sincerely,

[Redacted]
 Assistant Superintendent

Please fill out and have your child return this form ONLY if you do NOT wish your child to participate in either the research or videoing

Student Name _____ Date: _____

Please check one in each column.

<input type="checkbox"/> I DO NOT give permission for my child's participation in the research described above	<input type="checkbox"/> I DO NOT give permission for my child to be video-taped during one or two class periods
--	--

Parent/Caregiver Signature _____ Printed name: _____

Figure 13. Administrator's Guide Test Administration

Instructions for Word Generation Post-testing Administration

Introduction

On behalf of the Word Generation Team, thank you for your cooperation with this project as either a Phase I or Phase II School. In order to understand the effects of cross-content vocabulary instruction, we are asking participating students to complete pre and post tests that include a standardized vocabulary and reading comprehension test (Gates), a Word Generation vocabulary assessment, a motivation for reading questionnaire and a survey about students' civic engagement. Thanks again for your cooperation.

Please be sure to read through the attached administration guidelines and make sure that you have received enough test booklets for your entire class before the first testing day. If you need more test booklets, please contact your school-based Word Generation Lead Teacher. Please note that we may be asking your students to complete one brief additional assessment at another time. Your Word Generation Lead Teacher will contact you if so.

IMPORTANT: You may be receiving a test packet with a cover sheet that includes student names.

The cover sheet will look something like this:

Student Name: Last name, First Name
Teacher: Last name, First Name
School: Roosevelt
Grade Level: 7

However, it is also possible that the test packet will be coming separately from the cover sheet. **In that case please ensure that the cover sheet that is pre-printed with student names is stapled to the test packet** and that students receive the test packet with their own name on it.

Some students, who did not take the pre-test, will NOT have a pre-labeled cover sheet. We have provided extra assessments for those students. Although those students can still take the assessment we will not need those tests returned to us.

Administration Schedule:

We recommend that the test be given in two parts over the course of two days, although you are welcome to deviate from this schedule if it works better for your school. The researchers recommend that the Gates-MacGinitie Vocabulary and Comprehension Tests be given on the first day followed by the Word Generation Vocabulary Assessment, and then the Motivation for Reading Questionnaire on the second day. See below for a recommended testing schedule:

Day 1 (approximately 65-90 minutes)	The Gates-MacGinitie Vocabulary (p. 1) The Gates-MacGinitie Comprehension (p. 7)
Day 2 (approximately 65-90 minutes)	Motivation for Reading Questionnaire (p. 20) Civic Engagement Survey (p. 23) Word Generation Vocabulary Assessment (p. 25)

Fourth task:

Civic Engagement Survey (suggested day 2)

Overview of the Civic Engagement Survey:

- 35 questions
- Understand students’ confidence and interest in civic engagement and discussing the topics covered in Word Generation Units.
- This test is not timed.

Starting the Civic Engagement Survey:

SAY:

Please turn to the next page. The civic engagement survey has three parts; each has its own specific instructions. (Check that everyone has the correct page.) Please be sure to carefully read each set of instructions before moving on to the next. We will stop this survey once everyone has completed it. Are there any questions? (Answer questions.) You may now begin.

Stopping the Civic Engagement Survey:

Once the last student completes the survey...

SAY:

Everyone has now completed the survey. Please put your pencils down, close your booklets and listen to my last set of directions.

Figure 14. Cognitive Lab Interview Form

FOR THE INTERVIEWER

Civic Engagement Survey Cognitive Interview (SNIPPET)

SECTION 1

Instructions:

Please have the participants answer the survey question indicated in the student civic engagement survey. After each survey question, ask the participant the corresponding probe questions (indicated as a,b,c). Record the participants' response on this form.

<i>How often do you do the following?</i>
<i>a. Never</i>
<i>b. Rarely</i>
<i>c. Sometime</i>
<i>d. Often</i>
<i>e. Always</i>

a. When the question asks "never, rarely, sometime, often and always," do you think in terms of time like hourly, daily and weekly?

b. Describe something that you do each day that seems like "sometimes" and "always".

1. ... *Help out at your school*

a. What kind of things do you consider as helping your school?

b. Is it easy or hard to help out at your school?

2. ... *Help out a friend or neighbor*

a. What kind of things do you consider as helping your friend or neighbor?

b. Is it easier to help your friend or neighbor?

3. ... *Help poor or needy people in your city*

a. What do you consider as someone being poor?

Figure 15. Classroom Discussion Rubric Used by Observers

8304

INTRODUCTION

Checklist for Day 1 Components of WG Activity

YES	NO	
<input type="radio"/>	<input type="radio"/>	The routine for launching the Day 1 activities appeared smooth and efficient.
<input type="radio"/>	<input type="radio"/>	Teacher(s) had his/her WG workbook.
<input type="radio"/>	<input type="radio"/>	All students had their WG workbooks. If NO: How many did not? <input type="text"/>
<input type="radio"/>	<input type="radio"/>	Target word #1, _____, was introduced prior to reading the passage.
<input type="radio"/>	<input type="radio"/>	Target word #2, _____, was introduced prior to reading the passage.
<input type="radio"/>	<input type="radio"/>	Target word #3, _____, was introduced prior to reading the passage.
<input type="radio"/>	<input type="radio"/>	Target word #4, _____, was introduced prior to reading the passage.
<input type="radio"/>	<input type="radio"/>	Target word #5, _____, was introduced prior to reading the passage.
<input type="radio"/>	<input type="radio"/>	Target words were posted on a chart, overhead, or the board.
<input type="radio"/>	<input type="radio"/>	Teacher introduced the question of the week at outset of lesson.
<input type="radio"/>	<input type="radio"/>	Teacher provided some context for the question of the week prior to reading the passage or prior to introducing the words.
<input type="radio"/>	<input type="radio"/>	Passage was read aloud and students were able to see the text while listening. If NO: Students read passage silently. If NO: Teacher read passage aloud but at least one student did not have access to the text.
<input type="radio"/>	<input type="radio"/>	Teacher modeled comprehension strategies during reading.
<input type="radio"/>	<input type="radio"/>	Teacher prompted students to apply comprehension strategies during reading.
<input type="radio"/>	<input type="radio"/>	All WG comprehension questions were addressed following reading. If NO: Only a subset of WG questions were addressed. If NO: None of the WG questions were addressed.
<input type="radio"/>	<input type="radio"/>	Teacher posed questions beyond those in WG workbook.
<input type="radio"/>	<input type="radio"/>	Students used word chart to learn meanings, uses and forms of target words.

NOTES:

Figure 16. Civic Engagement Survey

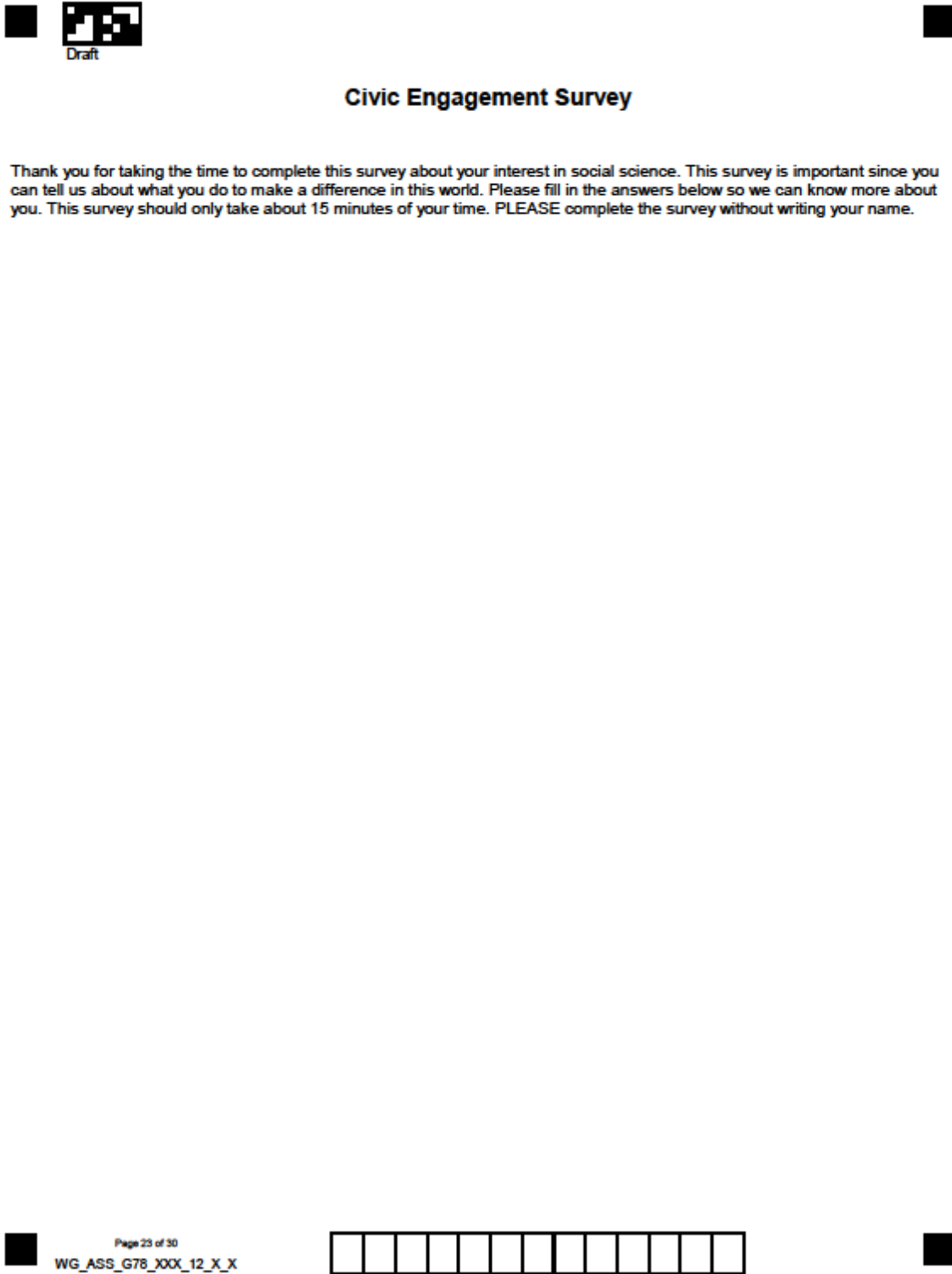


Figure 7

Draft

	Never 1	Rarely 2	Sometimes 3	Often 4	Always 5
1. How often do you help out at your school?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. How often do you help your friend?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. How often do you help poor people in your city?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. How often do you pay attention to news events in the media (TV, Internet, newspaper)?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. How often do your classmates discuss news events in class?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. How often do you talk about news events with your friends?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. How often do you talk about news events with your family?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. How often do you talk about news events in your classes?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9. How often does your teacher discuss news events in class?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Not at all interested 1	Slightly Interested 2	Somewhat Interested 3	Quite Interested 4	Extremely Interested 5
1. How interested are you in helping to make the world a better place?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. How interesting do you find politics?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. How interested are you in events that are going on in the world?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. How interested are you in talking about news events in your classes?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. How interested are you in hearing other people's point of view that may be different from yours?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. How interested are you in voting for the President when you get older?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. How interested are you in talking about news events with your family?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. How interested are you in talking about news events with your family after learning about it in your classes?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Page 24 of 30
WG_ASS_G78_XXX_12_X_X

Figure 7



Please use the question in the gray box to answer each topic.

How confident are you in being able to participate in a discussion about the following topics?

	Not at All 1	A Little 2	Somewhat 3	Very 4	Extremely 5
1. Should colleges use Affirmative Action?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. Should the government fund stem cell research?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. Should Creation be taught in school?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. Should schools protect students from cyberbullying?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. Should English be the official language of the United States?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. Should there be more strict dress codes at schools?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. Should schools be a place for debates?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. Should secret wiretapping be legal?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9. Is the death penalty justified?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10. Should athletes be allowed to use steroids?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
11. Does rap music have a negative impact on students?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
12. Is nuclear power a danger to society?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
13. What should be done about global warming?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
14. Should schools have a vocational track?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
15. Should the government allow animal testing?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

