

## 2024 REPORT



# CERL

Civic Education Research Lab

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### **Civic Education Research Lab**

The Civic Education Research Lab (CERL) at Georgetown University is dedicated to investigating the effectiveness of civic teaching and learning. Founded by Dr. Diana Owen, a Georgetown political science professor, CERL investigates the effectiveness of civic education for elementary, secondary, and university students. The CERL team conducts research on civic education programs and practices, civic engagement, and political communication in the digital age. To learn more: [Civic Education Research Lab \(georgetown.edu\)](https://georgetown.edu/cerl)

### **Center for Civic Education**

The Center for Civic Education ([civiced.org](https://civiced.org)) has led K-12 civic education nationwide since its founding in 1965. The Center provides professional development, curricular materials, instructional resources, toolkits, and support for civic educators on a broad scale. Its programs receive active endorsement from state bar associations, foundations, and educational, professional, business, and community organizations in every state and the District of Columbia. Since its inception, the Center's innovative, evidence-based programs have reached more than 42 million students and 440,000 educators in over 80 countries. Project Citizen provides a practical, first-hand approach to learning about how government works, how to monitor its actions, and how to influence public policy. Other Center programs and resources include its flagship We the People: The Citizen and the Constitution program, Civitas International Programs, and the Civil Discourse Toolkit. The Center and CERL have received six major grants from the U.S. Department of Education. These include the James Madison Legacy Project (2015-2020), Strengthening Democracy through History and Civics (2018- 2021), Project Citizen Research Program (2019-2024), James Madison Legacy Project Expansion (2021-2025), We the People: Civics that Empowers All Students (2022-2025), and Project Community: Media Literacy and Public Policy (2023-2026). To learn more: <https://www.civiced.org/>

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### **Disclosure of Potential Conflict of Interest**

The research team for this study is based at the Civic Education Research Lab at Georgetown University in Washington, D.C. Neither the author nor the staff have financial interests that could be affected by the findings of this study.

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Project Citizen (PC) was launched by the Center for Civic Education in California in 1992 and was disseminated nationally in 1995. To date, the program has been used in 75 countries (<http://civiced.org/programs/project-citizen>). PC’s objective is “to motivate and empower students to use the rights and responsibilities of democratic citizenship by intensively examining a policy issue in their schools or communities” (Ozturk, 2022). Students work as a class to identify a problem, research alternative policy-based solutions, develop a policy proposal to address the problem, and design an action plan to convince public officials to adopt and implement the policy. Students present their action plans and portfolios to leaders in their schools and communities. PC is designed to support students’ development of social and emotional learning (SEL) competencies and science, technology, engineering, and math (STEM) skills.

The Project Citizen Research Program (PCRCP) evaluated the effectiveness of the Center’s PC teacher professional development (PD) program and curriculum intervention for middle and high school students. The Civic Education Research Lab (CERL) at Georgetown University under the direction of Dr. Diana Owen conducted studies of three cohorts of PC teachers and students from 2020-2023—during the height of the COVID-19 pandemic. The PCRCP explored the impact of the PD program on teachers’ civic content knowledge, instructional objectives, use of active learning pedagogies, self-efficacy, and integration of STEM into the curriculum. Student academic learning outcomes after participating in PC related to acquisition of civic knowledge, dispositions, and skills, the development of civics-related SEL competencies, and the use of STEM in their classes were assessed. This report marks the culmination of that research.

The PCRCP sought to strengthen the research base for teaching and learning in social studies, especially the core discipline of civics. The program addressed the need for improving and providing civic education for all students. Delivering accessible quality civic education is especially urgent in schools with high concentrations of high-need students where attention to civics is typically overshadowed by a focus on subjects included in high-stakes assessments. High-need students are disadvantaged in the current system because they have less access to effective civics instruction tailored to their needs. Students from higher socioeconomic backgrounds receive more classroom-based civic learning opportunities than other students (Jamieson, 2013; Educating for American Democracy, 2021). A “civic opportunity gap,” has been identified where students from high-poverty environments lack access to service learning and organized activities that would prepare them for civic engagement (Kahne and Middaugh, 2008; Rubin, et al., 2016). Schools can exacerbate the “civic empowerment gap” (Levinson 2010, 2013)—where political power is concentrated among those with the greatest resources and

entitlements—by not providing equal civic preparation to students most in need of acquiring the capacities to participate effectively in political life. The gaps in opportunity, engagement, and empowerment begin early and grow wider over the life course (Hoggan-Kloubert, et al., 2023).

CERL employed an internal efficacy study to examine PC's impact on student civic education outcomes in comparison to the current practice of social studies teachers who employ traditional lecture and textbook-centric pedagogies in their classrooms. The core quantitative study design consisted of multi-site, school-level, randomized controlled trials (RCT) based on pretest/posttest surveys administered to middle and high school teachers and their students. The RCT compared PC teacher and student outcomes to those of the comparison group. CERL collected qualitative data to augment, enrich, and provide context for the quantitative analysis over the course of the three program years.

## **EXECUTIVE SUMMARY**

The Project Citizen Research Program (PCRP) evaluated the effectiveness of the Center for Civic Education’s Project Citizen teacher professional development and curriculum over the course of three academic years from 2020-23. Teachers attended a summer institute and follow-up professional development sessions throughout the academic year and instructed the Project Citizen curriculum. Middle and high school students work as a class to research and develop proposals for solving a policy problem in their school or community which they present to stakeholders. The research was conducted by the Civic Education Research Lab at Georgetown University. The PCPR was funded by a grant from the Institute of Education Sciences, U.S. Department of Education.

### **Key Study Findings**

#### **CIVIC KNOWLEDGE**

Project Citizen teachers’ knowledge of American government, democracy, and the public policy process increased significantly in each program year.

Project Citizen students’ civic knowledge improved significantly in all three cohorts.

- Middle school students’ civic knowledge increased by 44% in Year 1, 76% in Year 2, and 66% in Year 3.
- High school students’ civic knowledge increased by 27% in Year 1, 56% in Year 2, and 32% in Year 3.
- Knowledge growth was significantly greater for Project Citizen students than for students who took a traditional civics, social studies, American government, or American history class.

#### **CIVIC DISPOSITIONS**

Civic dispositions are the public and private traits, attitudes, and ingrained “habits of the heart” that are consistent with the common good and are central to the functioning of a healthy democracy.

Project Citizen teachers placed significantly more emphasis on civic dispositions in their classes after participating in the professional development program.

Project Citizen students embraced the virtues of good democratic citizens.

- Secondary school students became more inclined to keep informed about government and politics and pay attention to issues in their community.
- Secondary school students had a stronger commitment to vote in elections if given the opportunity.

- Students, like the general public, had low levels of trust in government and the news media. High school students' trust in government and media increased after the program.
- High school students became more interested in pursuing a career in government service and possibly running for office one day.
- Project Citizen students' civic dispositions improved more than those of the control group.

## CIVIC SKILLS

Civic skills are a range of proficiencies required for democratic engagement. They encompass behaviors beneficial to the development of personal agency that promotes civic engagement.

Project Citizen teachers were much more likely to emphasize civic skills during their classes.

- The number of teachers who focused a great deal on civic skills increased from 40% to 73% in Year 1, from 57% to 71% in Year 2, and from 22% to 47% in Year 3.
- Teachers' integration of activities that convey civic skills into their lessons increased by 156% in Year 1, 136% in Year 2, and 99% in Year 3.

Project Citizen prepared students to participate in their communities and public life.

- Secondary school students had a better understanding of policy issues facing the country.
- Students felt that they could help organize people to solve a problem in their community.
- Students could find the official or branch of government responsible for working on community problems.
- The findings were strongest for high school students.
- Project Citizens students' civic skills improved significantly more than those of students in the control group.

## CIVIC ENGAGEMENT

Civic engagement is voluntary involvement in community affairs that is put forth in the public interest. It is active participation that involves community service that is collaborative and works toward addressing areas of local, national, and global concern.

Project Citizen teachers became more confident in their ability to get students to engage in their community.

- The percentage of teachers who felt they were greatly effective in encouraging students to become involved in their community increased from 51% to 70% in Year 1, from 55% to 71% in Year 2, and from 47% to 54% in Year 3.

Project Citizen students felt better prepared to engage in political and public life after the program. The findings were strongest for high school students.

- The percentage of high school students who were very likely to turn out in elections increased from 69% to 72% in Year 1, from 63% to 69% in Year 2, and from 66% to 76% in Year 3.
- The percentage of high schoolers who were ready to engage in public life increased by 7% in Year 1, 10% in Year 2, and 6% in Year 3.
- The findings were more apparent for Project Citizen students than for those who took a traditional civics class.

## **CIVICS-RELATED SEL COMPETENCIES**

Social and emotional learning (SEL) is the process through which people develop the knowledge, skills, and attitudes conducive to achieving personal and collective goals, maintaining positive relationships, and making meaningful societal connections. Integrating SEL and civic learning can give students the opportunity to become caring and engaged community members.

Teachers felt more capable of promoting students' self-care and self-management, developing students' relationship skills, promoting respectful classroom discourse, and encouraging students' civic engagement after participating in Project Citizen.

- 77% of teachers felt that Project Citizen contributed to their students' acquisition of SEL competencies.

Project Citizen students gained civics-related SEL skills.

- Middle and high school students achieved significant gains in their problem solving abilities and civic expression skills.
- The gains in civics-related SEL skills were notably smaller for the control group students.

## **STEM IN THE CIVICS CLASSROOM**

The U.S. Department of education has advocated for the integration of science, technology, engineering, and mathematics (STEM) education across the curriculum, stating that “the complexities of today’s world require all people to be equipped with a new set of core knowledge and skills to solve difficult problems, gather and evaluate evidence, and make sense of information they receive from varied print, and increasingly, digital media.”

Project Citizen teachers were more inclined to have their students use STEM skills in their classes after the professional development program.

- 40% of Project Citizen teachers indicated that they were very prepared to incorporate STEM into the civics curriculum after participating in PCRCP compared to 3% pre-program.
- The percentage of Project Citizen teachers indicating that their students had use STEM skills in their classes doubled from 25% pre-program to 50% post-program.

- The percentage of Project Citizen teachers whose students conducted surveys increased from 51% to 88%. Control group teachers' use of surveys was limited and did not increase.
- Project Citizen teachers were more likely to have their students use technology to engage in the community after their professional development program.

Secondary school students who participated in Project Citizen applied STEM skills when conducting research for their projects.

- Project Citizen students were better able to understand how they can use STEM skills to address problems in their community.
- Middle and high school students were able to make a stronger connection between STEM and their civics classes after participating in Project Citizen.
- The effects were not apparent for control group students.

## **PROJECT-BASED LEARNING: THE PROJECT CITIZEN MODEL**

PC is project-based learning (PBL) developed for the civics, social studies, and American government context. PBL is a student-centered, dynamic learning pedagogical approach that provides students with the opportunity to engage actively and cooperatively with real-world issues and propose solutions. The Buck Institute for Education defines PBL as follows:

Project-based learning is a teaching method in which students gain knowledge and skills by working for an extended period of time to investigate and respond to an authentic, engaging, and complex question, problem, or challenge (Buck Institute for Education, 2024).

PBL allows students to move from the theoretical or hypothetical to the practical. Material covered in lectures and textbooks can be translated into real world experiences. PBL is highly adaptable and can be designed to address state and common core standards (Halvorsen and Duke, 2017). Learning-by-doing has been shown to increase knowledge retention and enhance the acquisition of dispositions and skills across a range of disciplines (Larmer, 2018). Students generally have positive views of classes that integrate PBL. They exhibit greater motivation to learn as they develop a stronger connection to the course content. PBL can initiate lifelong learning, as students gain soft skills, such as networking and teamwork, analytical skills, and technical skills, including data analysis (Albert, 2019). It has been shown to increase students' literacy skills by enhancing reading and writing comprehension (Wolpert-Gawron, 2018). The affirming impact of PBL on learning outcomes extends to high-need students, including students of color and students from lower income households (Vontz, Metcalf, and Patrick, 2000; Halvorsen and Duke, 2017).

PBL can improve student outcomes in civics, social studies, and related fields. Evidence suggests that students in project-based classes have greater gains in civic knowledge than those in traditional lecture-style courses (Kingston, 2018). A higher percentage of AP students who are taught using PBL achieve passing scores on the AP U.S. Government and Politics test than their peers. AP students also demonstrate a deeper understanding of the content and develop more sophisticated problem-solving skills (Parker, et al., 2013). PBL's emphasis on authentic, active, and collaborative learning contributes to its ability to increase students' civic orientations and related SEL competencies (Almulla, 2020). PBL can be a gateway to life-long civic engagement as it provides students with an invitation to take part in their community. It conveys knowledge of how the system works, instills an authentic desire to work for the good of society, and imparts the proficiencies necessary for participation. Students can develop SEL competencies, such as critical thinking, collaborative, and communication skills, that facilitate high-level civic engagement. In addition, students' facility with using STEM proficiencies can be advanced through PBL, such as when they are used to research and find evidence to support a policy position (Hanif, Wijaya, and Winaro, 2019).

At the same time, PBL is not without its critics who challenge its efficacy as a genuinely student-driven approach and argue that PBL requires substantial resources and can be difficult to implement in the classroom. There are concerns that PBL promotes activities at the cost of



covering core content knowledge. At a time when standardized tests and learning objectives have become the norm, students in classes using PBL may not have the depth of knowledge to perform well on these required assessments. A recurrent theme is that PBL is difficult to do well, especially given constraints on teachers' time and resources. PBL poses challenges to classroom management, as students are expected to be drivers of the project while teachers act as facilitators and monitor progress. It can be hard to keep students focused on the project. Identifying a problem that is relevant, doable, and aligned with real-world circumstances can be difficult. Teachers may not be able to connect with cooperative community partners to facilitate the project. Typical issues associated with group work, such as division of labor and disagreements among participants, may be exacerbated, especially when a project is tough to manage or controversial (Evenddy, Gailea, and Syafrizal, 2023). Students who lack skills, such as the ability to work collaboratively or to communicate effectively, will be disadvantaged even if they have a superior grasp of the subject matter (Aldabbus, 2018). Assessment of projects can be challenging, as teachers must provide students with continuous feedback while simultaneously motivating them to do independent work. The criteria for evaluating PBL outcomes is more complex, time-consuming, and open to subjective judgement than standardized testing, although the potential to find common ground exists (Miller, 2012).

## **Project Citizen**

Project Citizen encompasses best practices for PBL (see Larmer, 2018) and is designed to address the criticisms. It is inquiry-based, as students guided by teachers identify an issue or problem that is societally relevant or personally meaningful, such as a challenging situation within their school. They devise a question that will frame their project. The PC curriculum is intended to be implemented over a period of weeks as a form of sustained inquiry. Students have opportunities for input into how the project will proceed and are encouraged to express their ideas. They conduct research, propose alternate solutions to the problem they identified, and work collaboratively and cooperatively to arrive at a consensus about the proposal they will recommend. Students receive feedback as they present portfolios of their research and their proposal to community leaders and answer questions. They are encouraged to consider suggestions that have been offered by their teacher, peers, and stakeholders. The class reflects on their work and the process, which helps teachers to adapt the curriculum going forward.

The PC curriculum was designed to embrace core objectives of civic education. A fundamental goal is to provide students with knowledge and understanding of the country's foundational principles, democratic values, government institutions and processes, the political, social, and economic systems, and current affairs. PC also aims to convey civic dispositions and skills, including media literacy and critical thinking, that will prepare students to be informed and active participants in the civic life of their communities and country. More recently, goals associated with increasing awareness of issues of diversity, equity, inclusion, and representation have been prioritized (EAD, 2021; Winthrop, 2020).

Studies conducted in the U.S. and in other countries have found support for PC's ability to convey civic orientations. An early assessment employed case studies in the U.S. that documented PC students' "success stories." Students carried out projects that helped homeless teens, got a traffic light installed at a dangerous intersection, and developed a method for

conducting research on the World Wide Web that was widely adopted (Tolo, 1998). The curriculum was lauded as a “springboard” that provided American students with an entrée to community service opportunities by providing them with the requisite dispositions and skills for engagement (Atherton, 2000). Using a mixed method approach, a study of a middle school PC class in California found that the program improved students’ civic literacy, increased their sense of political efficacy, and helped to develop collaborative skills (Morgan, 2016). Research fielded in Idaho indicated that high school students who participated in PC had higher levels of political efficacy and a stronger sense of civic responsibility than college students who had not taken part in the program (Fry and Bentahar, 2013). A large-scale program evaluation found that middle and high school students who participated in PC made greater improvements in civic development, including civic knowledge, civic discourse skills, and public policy problem-solving skills than students in a control group. Teachers who had more experience teaching the curriculum had better student outcomes than those new to the program. The study found that PC had similar outcomes regardless of students’ gender, native language, and level of participation in extra-curricular activities. Non-White students made greater gains in persuasive writing ability, but racial/ethnic differences on other indicators were negligible (Root and Northup, 2007). Preliminary research on the PCRCP has found that PC students made statistically significant gains in civic knowledge, dispositions, skills, and SEL competencies as well as acquiring civics-relevant STEM skills (Owen and Irion-Groth, 2020; Owen, 2023).

Evaluators have noted that the PC intervention can be adapted to a wide range of classroom contexts which explains its widespread international use (Atherton, 2000). A comparative study of the effectiveness of PC in Indiana (U.S.), Latvia, and Lithuania found that the curriculum had positive, statistically significant impacts on civic knowledge, dispositions, and skills in all three countries. Students in Lithuania gained the most civic knowledge. Students in Lithuania and Latvia showed more interest in politics than their counterparts in Indiana. PC students in Indiana exhibited the greatest improvement in civic skills (Vontz, Metcalf, and Patrick, 2000). A study conducted in Taiwan employed a quasi-experimental design where twelve teachers each instructed one class using PC and another using traditional, discipline-based civics instruction. The findings demonstrated that PC students significantly outperformed students in the traditional civics class in terms of their level of political interest, commitment to the rights and responsibilities of citizenship, and development of core civic skills (Liou, 2004). Research in Indonesia employed a quasi-experimental design to test whether PC could be used to promote values-based education mandated by the country’s National Education System. The study found that PC was an effective model for developing democratic character traits, including critical thinking, positive interaction, discussion, and collaboration skills, and promoting decision-making that is in the public interest. The character orientations developed in the context of citizenship education carried over to the students’ daily lives (Kabatia, Irwan, and Firman, 2021).

## **Teacher Professional Development**

Effectively employing PBL in the classroom requires that teachers have the requisite active learning pedagogical skills. The need for quality PD for teachers implementing PC in their classrooms has been documented in the U.S. and abroad (Owen and Irion-Groth, 2020; Owen, 2023; Ozturk, 2022; Ozturk, Rapoport, and Ozturk, 2021; Root and Northup, 2007). Teachers’ grasp of relevant content may exceed what is required for a traditional lecture and textbook

heavy approach given the student-driven aspect of PBL. To deal with teacher shortages in recent years, state policymakers have been relaxing certification requirements (Will, 2022), which notably impacts civics and social studies education. Increasingly, instructors reach the classroom without sufficient coursework in the field (Hamilton, et al., 2020).

PC adapts project-based learning to the civics context. Teachers use interactive, student-centered, cross-disciplinary instructional approaches that integrate independent and group work. The PC PD program was aimed at developing teachers' capacity to work with students on all aspects of the curriculum. Scholars were consulted to enhance teachers' content knowledge of the U.S. Constitution, government institutions, and the public policy process. Mentors were engaged to help teachers develop effective pedagogies for instructing PC and improve their capacity to engage young people in the PC curriculum through inquiry-based and project-based learning methods. In addition to more standard knowledge of American government and institutions, PC teachers must be familiar with how the public policy process, interest groups, and non-governmental organizations work. They should be able to teach students core research skills, such as working with primary source documents, using evidence to support arguments, and evaluating alternative hypotheses and explanations. They also are encouraged to integrate STEM techniques in their PC classes, such as survey research and basic data analysis, so that their students can make the connection between STEM and policymaking. At present, students in STEM classes are far more likely to learn about the connection of science and math to civic engagement and public policy than students in social studies courses (Ross and Fried, 2022).

PC teachers enrolled in the PCRFP received 48 hours of PD sessions in the summer and the academic year. The PD began with four- or five-day summer institutes at sites across the country organized by the Center's staff and their network of state coordinators. The institutes were held in the summer before teachers would instruct PC with their students. Educators attended shorter follow-up PD sessions during the academic year which involved follow-up by mentors. They also participated in a professional learning community consisting of PCRFP participants, Center staff, state coordinators, and mentor teachers. They were prepared to implement the PC curriculum intervention in their classes during the academic year.

## **Classroom Curriculum Intervention**

The Project Citizen curriculum provides students with hands-on experience as they learn the fundamentals of the public policymaking process, come to understand the complexities of the American political system, and gain insights into how to monitor and influence government. A primary objective of PC is to have students understand why citizen participation is important to democracy. Students follow a six-step process where they identify and study one problem in their school or community, recommend a solution in the form of a policy proposal, and present their research and proposal as a portfolio at a simulated public hearing. Teachers and students have access to Level 1 and Level 2 textbooks that supplement the curriculum based on the classes' civic knowledge base. The Center has extensive online resources, including an interactive tool for learning how to put together a PC portfolio, scholar videos that convey information about the policy process, links to relevant web resources, and examples of successful projects. (See [Curriculum - civiced.org](https://www.civiced.org).)

The student intervention consists of two main components: 1) at least 20 hours of classroom instruction in PC and 2) development and presentation of a public policy portfolio. Some of the time developing the portfolio and preparing a presentation was undertaken during class. The amount of time spent in class was at the discretion of the teacher implementing the instruction. The underlying process targeted by the student intervention is the acquisition of civic knowledge, skills, and dispositions through the PC curriculum and its active, inquiry-based, project-based learning methods. The primary student educational outcomes to be sought include 1) an increase in knowledge of the methods and procedures of governmental institutions, 2) an increase in civic skills, 3) an increase in the development of positive civic dispositions, 4) an increase in civics-related SEL competencies, and 4) the improvement of STEM knowledge.

## METHODOLOGY

The study was guided by research questions related to the teacher PD program and the PC student curriculum intervention. The following questions address the effectiveness of the teacher PD program:

- To what extent does participation in the Project Citizen PD program improve teachers' knowledge and understanding of the public policy process and civic action?
- To what extent does participation in the Project Citizen PD program improve teachers' pedagogy?
- Are teachers more likely to incorporate active learning elements in their civics classes because of the Project Citizen PD program?

The following research questions guided the evaluation of student outcomes:

- To what extent does Project Citizen impact students' acquisition of civic knowledge? Specifically, do students gain knowledge of the workings of government, the public policy process, and civic action due to their participation in Project Citizen?
- To what extent does Project Citizen impact students' acquisition of civic dispositions?
- To what extent does Project Citizen impact students' acquisition of civic skills?
- To what extent does Project Citizen impact students' acquisition of civic-related SEL competencies?
- How is STEM integrated into the Project Citizen curriculum? To what extent does participation in Project Citizen improve students' comprehension of STEMs relationship to the policymaking process?

### Research Design

The study employed multi-site, school-level RCTs based on pretest/posttest surveys to assess the impact of the PD program on middle school and high school teachers and the PC curriculum intervention on students. The RCT design provided for randomized assignment of

teachers and their students to PC intervention and control groups at the middle school (grades 5-8) and high school (grades 9-12) levels. Protocols were filed with the Georgetown University Institutional Review Board (IRB) for the PCRCP teacher and student studies. Both studies were granted exemptions.<sup>1</sup>

The first intervention was the teacher PD program. The primary outcomes were increased teacher knowledge and understanding of the workings of government, public policy, and civic action as well as improved teaching practices. Pretests were administered to both the intervention and control group samples prior to the start of the PD program to get a baseline of teacher knowledge and the pedagogies they typically employ in their civics, social studies, and American government classes as well as their approach to instruction, teaching objectives, classroom climate, self-efficacy, and professional engagement. The knowledge tests were administered separately and were proctored by program coordinators, CERL staff, mentor teachers, and school administrators. Posttests measuring these concepts were administered to the PC teachers after they completed the PD program and implemented the Project Citizen curriculum in their classes. Control group teachers took the posttest after they had finished teaching their traditional civics class. The tests were administered and proctored online using a secure platform.

The second intervention measured the effectiveness of the Project Citizen classroom instruction on students' acquisition of knowledge of the methods and procedures of governmental institutions related to public policy and their development of civic skills and dispositions. In addition, the study analyzed the extent to which students were exposed to STEM in the Project Citizen curriculum. Students took pretests at the outset of the Project Citizen or their traditional civics class and took posttests at the conclusion of their class. The tests were administered during class time by their teacher using a secure online platform. Teachers were instructed to use the methods established by their institution for performing online testing.

The quantitative analysis was supplemented with qualitative data from open-ended survey items, interviews with study subjects, and observations of the PD sessions and student showcases. CERL researchers observed PD sessions in both online and in-person formats over the course of the study. PC's culminating activity is a showcase where students present their portfolios to community stakeholders. During the pandemic, many of the showcases were held virtually, making it possible for CERL team members to attend.

## Sampling

The population of interest in the study is middle and high school students who take a class where the teacher has implemented the Project Citizen curriculum. A hierarchical design was employed where schools (clusters) were randomly assigned to treatment and control groups. The school was the appropriate unit of randomization as PC can be implemented as a school-based project that involves more than one teacher and/or class. The PC program is suitable for students in most school settings, so the inclusion criteria were broad. The schools in the sample were public and private middle and high schools serving grades 5 through 12 throughout the United States that are representative of the schools in their district. All qualified teachers

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<sup>1</sup> Teacher Study IRB ID: STUDY00002719. Student Study IRB ID: STUDY00002026.

instructing civics, social studies, American government, or American history courses within a school were invited to enroll in the study. All students of teachers in the PC and control groups were recruited for the research.

Schools and their teachers were recruited for each cohort through the Center's network of state coordinator and mentor teachers via personal outreach to their extensive contacts, advertising in education-related publications, and posting on social media. Qualified applicants were accredited public or private middle and high school teachers of civics, social studies, American government, and American history courses in which the PC program could be incorporated in the ensuing academic year. Schools nationwide were recruited for participation in the PCRCP. All teachers within a school who qualified were invited to take part in the study. In many cases, a school had only one qualified instructor. Applications were submitted to the Center where they were reviewed to determine if they met the program and study criteria. Schools/teachers were then randomly assigned to the PC intervention and control groups. The students in the study represented diverse populations, including students at risk of failure. While there was no explicit intention to target teachers from schools serving high-need and economically disadvantaged students to the program, and this was not a prerequisite for participation, a majority of the participating teachers served these students.

A total of 70 schools were recruited for each study cohort; 35 schools were randomly assigned to the PC group and 35 to the control group. A total of 210 schools were enrolled over the three years and 180 completed the study. A total of 237 teachers enrolled in the study, and 196 stayed. A combined total of 6,521 students enrolled in the study and 5,415 stayed. The pandemic presented challenges for keeping schools, teachers, and students enrolled in the PCRCP. The common reasons for teachers leaving a study, such as changing positions, new teaching assignments, switching schools, curriculum shifts, and personal matters, were augmented with pandemic-related causes. Teachers had difficulty adapting to virtual and hybrid instruction during the first two cohorts as well as the return to fully in-person instruction in cohort 3. Some teachers who felt overwhelmed took leave mid-year, and their classes were taught by substitutes who were not enrolled in the research. Other teachers left the profession entirely. Students struggled with online learning, and some became completely disengaged. Close to 90% of students in the sample were from schools that served large numbers of high-need students, a population that was especially vulnerable during the pandemic. Steps were taken to curb attrition that had some success, but the pandemic effects on study participation were apparent. (Details on steps taken to curtail attrition and study attrition for schools, teachers, and students are provided in Appendix A: Methodology.)

## **Statistical Methodology**

Statistical analyses were conducted on the pretest/posttest teacher and student outcome data to determine if there were statistically significant changes that were aligned with the PC intervention. Difference of means tests (paired samples t-tests) were performed to identify within group shifts in the pretest and posttest outcome measures for the PC and control group teachers and students for each cohort. The middle and high school student samples for each cohort were analyzed separately. The pretest and posttest mean scores and standard deviations, the difference of pretest/posttest means and significance test, the percentage change in pretest/posttest means,

the effect size (Hedge's *g*), the improvement index, and the pretest/posttest correlation and significance test were reported. What Works Clearinghouse's (WWC) improvement index was computed from Hedge's *g*. It represents the average expected change in the percentile rank if an average comparison group member receives the intervention. In other words, it is the difference in percentile ranks for an average intervention versus comparison group member.<sup>2</sup>

Hierarchical linear models were estimated using analysis of covariance (ANCOVA) to determine if there were statistically significant differences in the adjusted posttest scores of the intervention and control group teachers and students. ANCOVA was an appropriate model for this analysis as it adjusts for non-equivalence in intervention and control group scores at baseline. For the teacher analysis, the dependent variables were posttest scores. Pretest scores were entered as a covariate. Intervention/control group was treated as a fixed factor. Separate ANCOVA models were estimated for middle and high school students. Posttest outcome measures were the dependent variables. Pretest outcome measures and a variable coded for the students' school were entered as covariates. Intervention/control group was a fixed factor. Effect size for the difference of adjusted posttest means between the PC and control groups tests was estimated by Hedges' *g*. In the ANCOVA models, the adjusted means and unadjusted standard deviations were used in computing the effect sizes.<sup>3</sup> WWC's improvement index was calculated from Hedge's *g*.

The interpretation of effect sizes in education research has become a matter of debate. A common approach adopts Cohen's (1988) benchmarks which were based on a small number of controlled lab experiments in social psychology conducted in the 1960s that primarily used undergraduate subjects. Kraft argues that "effects that are small by Cohen's standards are large relative to the impacts of most field-based interventions" (2020: 241). Meta-analyses of more recent well-designed field experiments in education research have found that effect sizes with potentially important consequences are interpreted as having no or small effects using Cohen's guidelines. Kraft suggests that the magnitude of effect sizes depends on what and how outcomes are measured. Fixed benchmarks, while easy to use, cannot account for differences in study features and outcomes (Kraft, 2020). Comparable studies to the present research use pretest/posttest survey methods to examine student civic learning. Findings for students' civic knowledge outcomes that are not overly aligned with the intervention typically have larger effects than studies of students' civic dispositions and skills. Thus, it is prudent not to dismiss small, significant effect sizes related to these outcomes.

The percentage difference between pretest and posttest means was reported for the paired samples *t*-tests and for the adjusted posttest means based on the ANCOVA analysis for the PC and control groups. The percentage change is a useful statistic as it is easily interpreted and accessible to a wide audience. However, as a ratio it can be misleading, especially if the initial value is near zero (Curran-Everett and Williams, 2015), which was rarely the case in this study. The percentage difference supplements other measures of change that are reported.

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<sup>2</sup> Institute for Education Sciences. 2022. What Works Clearinghouse, Procedures and Standards Handbook, version 5, U.S. Department of Education, pp. 186-187.

<sup>3</sup> Institute for Education Sciences, 2022. What Works Clearinghouse, Procedures and Standards Handbook, version 5, pp. 135-36.

## THE IMPACT OF THE COVID-19 PANDEMIC

The three cohorts of the PCRCP spanned the course of the COVID-19 pandemic. The cohort 1 study was conducted in 2020-21, cohort 2 in 2021-22, and cohort 3 in 2022-23. In each year, the PD program began with a summer institute and the curriculum was taught during the following academic year during which teachers attended follow-up PD sessions. The method of delivering the PD and the curriculum shifted over the course of the study.

As the PCRCP was undertaken during the pandemic, the study offers a unique opportunity to track the implementation, outcomes, and possibilities of a civics program that relies heavily on active learning during periods of societal upheaval and shifting conditions in the educational environment. The unique circumstances of implementing PC during the pandemic presented challenges. Teachers and students had to adapt to virtual and hybrid instruction. Disruptions to program implementation occurred due to COVID-related absences of teachers and students. Some teachers left the profession midcourse, requiring classes to be combined or substitutes to be brought in for the remainder of the school year. Even as teachers and students returned to the classroom, shifting modes of delivering the curriculum coupled with the lingering deleterious effects of the pandemic on student learning (Kuhfeld, et al., 2022; Kwakye and Kibort-Crocker, 2021), engagement (Hutchinson and Moore, 2021), and behavior (Lambert, 2022, Shen-Berro, 2023) posed novel challenges to implementing the PC curriculum.

The Center adapted the PCRCP to meet the pandemic-created conditions that were unanticipated when the program was planned. The teacher PD program took place online in cohort 1 and combined in-person and virtual formats in cohorts 2 and 3. Novel active learning strategies for implementing PC in the virtual classroom were developed that have lasting value. Projects were modified so that they addressed problems that could be tackled and were meaningful in the pandemic environment. Students' projects focused on issues such as the proliferation of pet adoptions, increasing substance abuse among young people, food insecurity, a lack of access to resources for those living in poverty, and mental health problems.

The pandemic seriously disrupted the normal course of secondary school instruction during the first study cohort (2020-21), as most schools rapidly transitioned to virtual learning. Despite the challenges, the Center proceeded with the first year of the PCRCP in an all-virtual format. The majority of teachers (69%) implemented the PC curriculum intervention with their students virtually. Twenty-eight percent of teachers met with their students partially online and partially in-person or in a hybrid learning environment. Only 2% of teachers implemented the PC curriculum entirely in-person. Students presented their project portfolios—the culminating PC activity—primarily online to panels of community and government leaders. Teachers continued to deal with the impact of the COVID-19 pandemic during cohort 2 (2021-22). The instructional environment was characterized by a constant state of uncertainty, as teachers were still adapting to the conditions of the pandemic. Almost all (97%) of the teachers participating in the PCRCP had taught their classes virtually for at least part of the previous academic year. While most schools started the new academic year with the intention of holding classes in-person, only 36% of PCRCP teachers taught their classes in-person for the duration. Sixty-four percent of teachers held classes virtually for at least part of the time. By cohort 3 (2022-23), all of the educators in



the study were teaching in person, although some experienced short periods of virtual instructional continuity during heavy outbreaks of the virus.

While often an effective approach for imparting civic knowledge, skills, and dispositions, PBL can be challenging to execute under the best of circumstances. As the PCRP was implemented during the height of the COVID-19 pandemic, each cohort of teachers and students faced a shifting set of challenges. The classroom environment—virtual, in-person, or in between—was unsettled. Quarantines and school closures kept teachers and students out of the classroom, as absenteeism rose to astronomical levels. Valuable instructional time was lost. Teachers had to adjust their lesson plans and pedagogical approaches rapidly. Students faced disruptions in their schooling and mental health challenges that adversely affected their learning. The pandemic continues to have substantial, persistent negative impacts on students' academic performance and classroom climate to this day (Kuhfeld, et al., 2022).

The PCRP was not immune to these negative circumstances and their effects. Teachers in the PC and control conditions dropped out of the study, indicating that they were having difficulty keeping up with even the basics of day-to-day classroom instruction. Some teachers in the study left the profession. Instructors struggled to implement the curriculum virtually, especially when students turned off their videos, played on their phones, or got up and walked away from the computer. Managing students doing group work in virtual breakout rooms was a challenge. Presenting the project to stakeholders using a video conferencing platform was difficult for some students, while others were more comfortable expressing themselves in this environment.

PC teachers described their experience implementing the curriculum during the pandemic and the ways that they adapted.

This was a hard year for teaching, so trying to implement project-based learning in a hybrid setting was difficult. We also had limited instructional time, so adding to the already heavy load seemed impossible. I implemented PC as a club, which worked well, but I had less students participate because it was outside of school hours.

The pandemic forced all if not most of my days to use Google Meets. At the start of the year, most students were present. Motivation waned towards the end of the quarter and semester. Students would sometimes show up, turn the computer screen on but not participate .... probably "ghosting." Project Citizen helped motivation and enabled the "doers" to take control of the motivation problem as I asked the students to do...Project based learning!

Teaching during the pandemic presented numerous challenges this year. Teaching online all year and hybrid for part of the year made it difficult to conduct parts of the project. Not having the face-to-face conversations and having different numbers of students per class in-seat vs. online made discussion difficult. I was forced to move course content to the forefront of my schedule, which made it difficult to work in some elements of the project. I find Project Citizen to be very engaging and look forward to trying it next year under more conventional circumstances.

## SCHOOL CHARACTERISTICS

School characteristics consisting of public or private school, school type, geographic location, Title I school designation, and type of high-need students served were recorded. (See Table 1.) The type of school consisted of alternative, charter, magnet, parochial, religious, and technical schools. The location of a school in a rural, suburban, or urban geographic area was recorded. Title I schools serve a high percentage of low-income students who are living below the national poverty line and receive federal funding (NCES, 2019). Schools serving high-need students had 30% or more of students who receive free or reduced cost lunch, minority students, students living in poverty, students far below grade level, English learners (ELL), students with disabilities (SWD), students unhoused or in foster care, student served by rural local education agencies (RELA), disconnected or migrant youth, and incarcerated students.

Most of the teachers in all three cohorts taught in public schools. In cohort 1, 96% of PC and 95% of control teachers worked in public schools. Eighty-nine percent of PC teachers in cohort 2 were employed in public schools compared to 96% of the control group. In cohort 3, 96% of PC teachers and 91% of control group teachers worked in public schools. A small percentage of teachers in each cohort worked in alternative, charter, magnet, parochial, religious, and technical schools.

A higher percentage of PC teachers (25%) in cohort 1 taught in rural schools than control group teachers (16%). More control group schools (37%) than PC schools (24%) were located in urban areas. The pattern was reversed in cohort 2, as 27% of PC schools were in rural areas compared to 33% of control group schools. Twenty-eight percent of PC schools were in urban areas versus 15% of control group schools. In cohort 3, the trend was similar to cohort 1 with a higher percentage of PC schools (21%) located in rural areas compared to control group schools (13%). Thirty-eight percent of PC schools were in urban areas as were 55% of control group schools. The highest percentage of schools (between 40% and 52%) were in suburban areas with the exception of control group schools in cohort 3.

A majority of teachers in the study worked in schools that served high-need students. Half of the PC and control teachers in all three cohorts were employed in Title I schools. In cohort 3, 61% of the control group teachers served in Title I institutions. Sixty percent or more of schools had high percentages of students receiving free or reduced cost lunches. The highest percentage was in cohort 3, with 76% of PC schools and 83% of control group schools serving this student population. Fifty percent or more of PC and control group schools had large numbers of minority students across cohorts, except for the control group in cohort 2 (25%). In cohort 1, 36% of PC schools and 30% of control group schools had high numbers of students far below grade level, compared to 19% for both groups in cohort 2, and 36% of PC schools and 52% of control group schools in cohort 3. Thirty percent of PC schools and 23% of control group schools in cohort 1 and 25% of PC schools and 16% of control group schools in cohort 2 had large numbers of ELLs. The number of schools serving high percentages of ELLs was greatest in cohort 3 for both PC schools (42%) and control group schools (57%). Small numbers of schools had high percentages of unhoused students/students in foster care, students served by RLEA, and disconnected or migrant youth. A control group school in cohort 2 worked with incarcerated students.

**Table 1  
School Characteristics**

Characteristics	Cohort 1		Cohort 2		Cohort 3	
	Project Citizen	Control	Project Citizen	Control	Project Citizen	Control
<b>Public School</b>	96%	95%	89%	96%	96%	91%
<b>Private School</b>	4%	5%	11%	4%	4%	9%
<b>School Type</b>						
Alternative	5%	2%	1%	5%	4%	2%
Charter	8%	12%	4%	0%	8%	0%
Magnet	9%	0%	3%	0%	9%	16%
Parochial	0%	6%	4%	0%	1%	3%
Religious	1%	0%	5%	3%	2%	2%
Technical	3%	4%	1%	0%	1%	0%
<b>Geographic Area</b>						
Rural	25%	16%	27%	33%	21%	13%
Suburban	51%	47%	45%	52%	41%	32%
Urban	24%	37%	28%	15%	38%	55 %
<b>Title I School</b>	48%	49%	51%	48%	49%	61%
<b>School Serves High Percentage</b>						
Free or Reduced Cost Lunch Recipients	67%	59%	64%	66%	76%	83%
Minority Students	56%	50%	55%	25%	66%	61%
Students Living in Poverty	52%	34%	44%	44%	60%	52%
Students Far Below Grade Level	36%	30%	19%	19%	36%	52%
English Learners	30%	23%	25%	16%	42%	57%
Students with Disabilities	25%	23%	23%	13%	30%	26%
Students Unhoused or in Foster Care	13%	11%	8%	19%	17%	4%
Students Served by RLEA	7%	7%	7%	6%	4%	0%
Disconnected/Migrant Youth	6%	5%	4%	3%	11%	0%
Incarcerated Students	0%	0%	0%	3%	0%	0%

## TEACHER CHARACTERISTICS

The profiles of teachers in the PC and control groups were similar. (See Table 2.) In general, teachers in the study had earned advanced degrees and had taught civics courses for ten years or more. Most were civics instructors while a smaller number primarily taught American history. (See Table 2.)

A majority of teachers in the study held advanced degrees (master's, law degree, doctorate). Twenty-five percent of PC teachers held a bachelor's degree in cohort 1 compared to 32% in the control group. Seventy-five percent of PC teachers had an advanced degree as did 68% of the control group educators. In cohort 2, 20% of the PC teachers and 18% of the control group teachers had bachelor's degrees, while 80% or more of both groups had advanced degrees. A somewhat higher percentage of the cohort 3 control group teachers (91%) had earned advanced degrees compared to the PC group (74%). A quarter of the PC teachers had a bachelor's degree compared to 9% of the control group.

Overall, teachers in the PCRCP study had taught civics, social studies, or American government for at least ten years. In cohort 1, the PC teachers had taught civics for an average of 11.3 years compared to 14.5 years for the control group teachers. The PC group educators taught civics at their present school for 7.3 years versus 8 years for the control group. The cohort 2 PC teachers had been civics instructors for an average of 12 years compared to 13.1 years for the control group teachers. The PC teachers had been at their present school for an average of 7.6 years while the control group teachers were at their present school for 9.6 years. In cohort 3, the PC teachers had taught civics for an average of 10.1 years versus 10.5 years for the control group. The control group teachers had been at their present school somewhat longer (7.4 years) than the PC group teachers (5.3 years). Almost all of the teachers in the study taught middle and high school students.

Most of the teachers in the study identified their primary area of instruction as civics, social studies, American government, and American history taught through the lens of civics. These teachers constituted eighty percent or more of PC teachers in all three cohorts. Eighty percent of control group teachers in cohort 1, 85% in cohort 2, and 69% in cohort 3 were civics instructors. A smaller percentage identified primarily as American history teachers.

A small percentage of teachers in each cohort taught special education students, ELLs, Native American students, and adult education students. Special education teachers comprised 6% of PC teachers and 7% of control teachers in cohort 1, 8% of PC teachers and 3% of control teachers in cohort 2, and 11% of PC teachers and no control teachers in cohort 3. Three percent of PC and 2% of control group educators taught Native American students in cohort 1, compared to 8% of PC and no control group teachers in cohort 2, and 2% of PC and 4% of control group instructors in cohort 3. Advanced placement (AP) civics, social studies, and American history teachers were well represented in the sample. However, the classes that they taught for the study were not AP courses. In cohort 1, 28% of PC teachers and 12% of control group teachers were AP instructors as were 26% of PC and 41% of control group teachers in cohort 2, and 30% of PC and 13% of control group educators in cohort 3.

Teachers participating in the study primarily taught middle school (grades 5-8) and high school (grades 9-12). A small percentage of elementary school (grades 1-4) teachers took part in the program. In Cohort 1, 5% of PC participants taught elementary school, 43% taught middle school, and 52% taught high school. Two percent of control group teachers were elementary educators, 51% taught middle school, and 46% taught high school. In Cohort 2, the PC group was comprised of 7% elementary school teachers, 38% middle school teachers, and 55% high school teachers. Four percent of the control group taught in elementary school, 41% in middle school, and 56% in high school. Among the cohort 3 PC teachers, 4% instructed elementary schoolers, 47% middle schoolers, and 55% high schoolers. Fifty-two percent of control group teachers instructed middle school students and 48% taught high school students. One teacher's PC class consisted of both elementary and middle school students while another PC class was comprised of middle and high school students.

**Table 2**  
**Teacher Characteristics**

Characteristics	Cohort 1		Cohort 2		Cohort 3	
	Project Citizen	Control	Project Citizen	Control	Project Citizen	Control
<b>Highest Degree Earned</b>						
Bachelor's	25%	32%	20%	18%	26%	9%
Master's	67%	55%	79%	71%	62%	91%
Law	3%	7%	1%	4%	0%	0%
Doctoral	4%	5%	0%	7%	6%	0%
<b>Average Years Teaching</b>						
Civics	11.3 yrs	14.5 yrs	12 yrs	13.1 yrs	10.1 yrs	10.5 yrs
Civics at Present School	7.3 yrs	8 yrs	7.6 yrs	9.6 yrs	5.3 yrs	7.4 yrs
<b>Subject</b>						
Civics	82%	80%	80%	85%	79%	69%
History	18%	20%	20%	15%	21%	31%
<b>Teacher of</b>						
Special Education Students	6%	7%	8%	3%	11%	0%
Native American Students	3%	2%	8%	0%	2%	4%
ELL/ESL	6%	9%	12%	6%	13%	9%
Adult Education	2%	2%	0%	3%	8%	4%
<b>AP Teacher</b>	28%	12%	26%	41%	30%	13%
<b>Grade Level*</b>						
Elementary School	5%	2%	7%	4%	4%	0%
Middle School	43%	51%	38%	41%	47%	52%
High School	52%	46%	55%	56%	55%	48%

## STUDENT CHARACTERISTICS

Students' demographic characteristics were similar for the PC and control groups across the three study years. (See Table 3.) In cohort 1, the PC intervention group consisted of 53% female, 45% male, and 2% gender non-binary students. The control group students included a higher percentage of males (55%) than females (44%), with 1% identifying as non-binary. In cohort 2, the PC group consisted of 46% male, 50% female, and 4% non-binary students. The control group had 49% male, 46% female, and 5% non-binary participants. The PC group in cohort 3 was composed of 49% female, 47% male, and 4% non-binary students. The control group consisted of 51% male, 45% female, and 4% non-binary students.

The students participating in the PCRCP study were racially and ethnically diverse. (See Table #.) In cohort 1, the racial/ethnic composition of the PC and control groups was similar. Eight percent of students identified as Asian American Pacific Islander (AAPI), 14% as Black/African American, 17% as Latine, 49% as White/Caucasian, and 12.4% as multiracial. The cohort 2 students in the PC group were 6% AAPI, 11% Black, 23% Latine, 49% White, and 11% multiracial. In the control group, 12% of students identified as AAPI, 5% as Black, 18% as Latine, 52% as White, and 13% as multiracial. In the cohort 3 PC group, 11% of the students were AAPIs, 9% were Black, 28% were White, and 15% were multiracial. The control group included 7% AAPI, 9% Black, 31% Latine, 39% White, and 14% multiracial students.

**Table 3**  
**Student Characteristics**

Characteristics	Cohort 1		Cohort 2		Cohort 3	
	Project Citizen	Control	Project Citizen	Control	Project Citizen	Control
<b>Gender</b>						
Male	53%	44%	46%	49%	49%	51%
Female	45%	55%	50%	46%	47%	45%
Non-Binary/Other Gender	2%	1%	4%	5%	4%	4%
<b>Race</b>						
AAPI	8%	8%	6%	12%	11%	7%
Black/African American	12%	16%	11%	5%	9%	9%
Latine	18%	16%	23%	18%	28%	31%
White/Caucasian	51%	47%	47%	52%	37%	39%
Multiple Races	11%	14%	11%	13%	15%	14%

## High-Need Students

While the PCRP did not intentionally recruit schools serving high-need students, the study included a sufficiently large number of these students to allow for subgroup analyses. High-need students are those at risk of educational failure, underserved, and/or in need of special assistance and support. These students often receive substandard civic education or are denied opportunities for civic learning entirely. As the K-12 student population has become increasingly diverse, disparities in civic education have persisted, even grown (Kahne and Middaugh, 2008; Fitzgerald, et al., 2021; U.S. Department of Education, 2023). Parts of this report include analyses of civic outcomes for students of color (SOLs), English language learners (ELLs), students with disabilities (SWDs), students performing below grade level, and students living in poverty for the PC group. Students of color are defined as students who identify as Black or African American, Latine, Chicanx, Asian, South Asian, Pacific Islander (AAPI), Middle Eastern, Native American, and multiracial (Institute of Education Sciences, 2023). ELLs are students whose native language is something other than English or who lack proficiency in English and are eligible to participate in language assistance programs (U.S. Department of Education, 2016). They are a diverse group of students who have different language abilities and backgrounds. Among their ranks are refugees, migrants, students with interrupted education, internationally adopted students, and unaccompanied minors (Colorin Colorado, 2019). Students with disabilities, as defined under the Individuals with Disabilities Education Act, are students with “a disability that adversely affects academic performance and are in need of special education and related services” (IDEA, 2018). Students with disabilities have unique learning needs and require specially designed instruction. The range of disabilities that can affect students’ learning ability includes intellectual disabilities, speech or language impairment, hearing impairment, visual impairment, serious emotional disturbance, traumatic brain injury, orthopedic impairments, autism spectrum disorder, and developmental delay. Students living in poverty were identified as those qualifying for free or reduced cost meals. Students performing far below grade level have not mastered the skills and concepts at their expected level of difficulty as measured by formal assessments and district or state standards. Classification of students in the study into these categories was based on teachers’ reports of their classroom composition. (The number of students in the PCRP in each category by cohort and grade level appears in Table 4.)

**Table 4**  
**Number of High-Need Students in PC Sample**

	Cohort 1		Cohort 2		Cohort 3	
	Middle School	High School	Middle School	High School	Middle School	High School
Students of Color	101	463	232	272	392	258
English Learners	93	246	100	132	273	217
Students w/ Disabilities	64	193	80	144	214	94
Below Grade Level	98	319	156	137	335	133
Living in Poverty	131	475	232	385	492	360

## CIVIC KNOWLEDGE

A focal outcome of the PCRCP for teachers and students was the acquisition of civic content knowledge. Civic knowledge encompasses a vast amount of factual information pertinent to the principles of democracy, the Constitution and foundational documents, institutions of government, political processes, public policies, laws, and norms as well as current events. Knowledgeable citizens understand their role in a democratic polity, know their rights and responsibilities in society, and are aware of America's place in the world (Branson and Quigley, 1998; Van Camp and Baugh, 2016). People possessing greater civic knowledge tend to be supportive of democratic values, such as liberty, equality, and political tolerance, and are more politically efficacious. They have the confidence and ability to stake a position in the marketplace of political ideas (Finkel and Ernst, 2005; Galston, 2004; Brody, 1994; Youniss, 2011). Knowledge is fundamental to the development of civic competence. It contributes to the establishment of a civic identity that disposes individuals toward engagement in political life. The connection between knowledge and engagement has been used to justify its prominence in civics instruction. The consistent finding of this association feeds the argument that knowledge is a building block, if not a necessary precondition, for action (Delli Carpini and Keeter, 1996; Niemi and Junn, 1998; Galston, 2004; Milner, 2010; Campbell, 2006; Van Camp and Baugh, 2016).

Knowledge has been described as the “bedrock” (Hoffman, 2019) or “basic currency” of democracy (Delli Carpini and Keeter, 1996). The notion of the “informed citizen” is a central attribute of a “good citizen.” Students’ ability to access, acquire, and evaluate political information has become an increasingly pressing issue in the age of digital media. Generational differences in news consumption suggest that young people are less discerning about the information they consume and are less likely to retain quality political knowledge than older citizens (Kleinberg and Lau, 2019). The rise of misinformation has distorted the public’s beliefs about government and politics (Jerrit and Zhao, 2020). At the same time, people have become more confident in their civic knowledge, even when it is blatantly erroneous (Graham, 2018). Civic learning provides students with a strong grounding in core knowledge and has been suggested as an antidote to these trends (Winthrop, 2020). This requires that teachers have sufficient command of civic content knowledge.

### Teachers’ Civic Knowledge

Teachers reported that their participation in the PC curriculum and PD greatly advanced their own civic content knowledge. They had moderate to large statistically significant knowledge gains across all three cohorts. Teachers’ posttest civic knowledge scores were significantly higher than the scores of the control group. Teachers described PC as an enjoyable experience that contributed to many areas of personal growth. One PC teacher explains, “I have gained so much information myself. This was a learning process for me as well as my students. I look forward to teaching Project Citizen next year.” Teachers highlighted PC’s focus on government and public policy which advanced their own knowledge. One teacher recalled, “Learning about public policy was very helpful. I didn't really understand it before. I feel better able to explain what it is. I enjoyed hearing experts in government.”



## Measurement

Teachers' civic knowledge was measured by an index consisting of 46 multiple choice questions. (See Appendix C.) The items tapped teachers' general knowledge of the public policy process, federalism, branches of the U.S. government, government departments involved in the policy process, interest groups, and nongovernmental organizations. While these content areas are relevant to the PC curriculum, the items were not overly aligned with the intervention. The items were derived from questions used in established civic knowledge inventories, such as the AP test, the National Assessment of Educational Progress (NAEP) Civics Assessment, and the evaluation of the James Madison Legacy Project (JMLP) (Owen, Hartzell, and Sanchez, 2020). Each multiple-choice item had four answer choices and the option of responding "I don't know." One point was awarded for a correct answer; no points were given for incorrect or "don't know" responses. The 46 items were combined to form an additive civic knowledge index. All items composing the index have known reliability that meets WWC standards. The pretest and posttest knowledge index reliabilities (Cronbach's  $\alpha$ ) exceeded .870 for all three cohorts. (See Table 5.)

**Table 5**  
**Teacher Knowledge Index Range and Reliability**

	<b>Index Range</b>	<b>Pretest Cronbach's <math>\alpha</math></b>	<b>Posttest Cronbach's <math>\alpha</math></b>
<b>Cohort 1</b>	0-46	.91	.88
<b>Cohort 2</b>	0-46	.87	.89
<b>Cohort 3</b>	0-46	.87	.91



## Analysis

Difference of means tests (paired-sample t-tests) were performed for the PC and control group samples. (See Table 6.) Teachers who received the PC PD had significantly greater gains in civic knowledge than those in the control group in all three cohorts. The pretest/posttest improvement in the PC groups' scores increased with each successive cohort. The percentage change was 8% for cohort 1, 15% for cohort 2, and 21% for cohort 3. The effect sizes for the PC group were .44, .95, and 1.07, respectively. The improvement index scores were +17 percentile points for cohort 1, +32 for cohort 2, and +41 for cohort 3. The difference in pretest/posttest knowledge scores was small and nonsignificant for the control group across the board.

**Table 6**  
**Teachers' Knowledge by Condition**  
**Difference of Means**

	Cohort 1		Cohort 2		Cohort 3	
	PC	Control	PC	Control	PC	Control
Pretest $\bar{x}$	27.71	27.56	26.47	28.92	25.02	25.63
Pretest SD	7.48	6.10	8.38	5.90	7.83	8.00
Posttest $\bar{x}$	29.93	27.86	30.41	30.00	30.21	24.79
Posttest SD	5.75	6.18	6.49	5.47	5.53	8.82
$\bar{x}$ Difference	2.18	.30	3.94	1.07	5.18	-.85
Sign. Difference	.00	NS	.00	NS	.00	NS
Percentage Change	8%	1%	15%	4%	21%	-3%
Effect Size	.44	.08	.95	.26	1.07	-.14
Improvement Index	+17	+3	+32	+10	+41	-6
Pre/Post Correlation	.74	.82	.87	.74	.80	.78
Sign. Correlation	.00	.00	.00	.00	.00	.00
n	36	27	34	27	39	33

ANCOVA, which adjusts for non-equivalence in intervention and control group knowledge scores at baseline, was performed to estimate the difference in PC and control group posttest scores. Posttest knowledge was the dependent variable, PC/control group condition was a fixed factor, and pretest knowledge was a covariate. The PC teachers' posttest knowledge scores were significantly higher than the control groups' scores for all three cohorts. The difference in PC/control group scores was greatest for cohort 3 at 19%, compared to 7% for cohort 1 and 8% for cohort 2. The effect sizes (Hedge's *g*) were moderate for the first (.33) and second (.41) cohorts, and large (.80) for the third cohort. The improvement index scores were +13, +16, and +29 percentile points. (See Appendix B, Table B1.)

## Teachers' Instructional Objectives: Civic Knowledge

A fundamental goal of the PCRCP was for teachers to convey knowledge and understanding of the country's foundational principles, democratic values, government institutions and processes, the political, social, and economic systems, current affairs, and public

policymaking to their students. Teachers recorded how much emphasis they placed on six core dimensions of civic knowledge in their classes. Conveying civic knowledge was a top priority for teachers from the outset of the study. The slight increases in the PC teachers placed on core civic knowledge from pretest to posttest were not statistically significant. The one exception was the significant decline in the control group’s emphasis on these aspects of civic knowledge in cohort 2.

**Measurement**

Teachers were asked questions related to their embrace of civic knowledge objectives on the pretest and posttest. Six items addressed this objective: 1) educating students about core democratic principles as set forth in the Declaration of Independence and U.S. Constitution, 2) educating students about government and how it works, 3) teaching students about current events, 4) teaching students about the electoral process, 5) teaching students about the economic system, and 6) educating students about the relationship of the United States to other nations and world affairs. Teachers were asked how much they emphasized these goals in their classroom 1 not at all, 2 very little, 3 somewhat, 4 a great deal. These items were combined to form an additive civic knowledge instructional objectives index that ranged from 1 (very little emphasis) to 18 (a great deal of emphasis). The reliability (Cronbach’s  $\alpha$ ) of the pretest/posttest indexes for the three cohorts was acceptable. (See Table 7.)

**Table 7  
Civic Knowledge Objectives Index Range and Reliability**

	<b>Index Range</b>	<b>Pretest Cronbach’s <math>\alpha</math></b>	<b>Posttest Cronbach’s <math>\alpha</math></b>
<b>Cohort 1</b>	1-18	.82	.83
<b>Cohort 2</b>	1-18	.80	.80
<b>Cohort 3</b>	1-18	.88	.90

**Analysis**

Teachers in the PC and control groups began with average scores indicating that they placed a strong emphasis on imparting civic knowledge at the outset which remained consistent over the course of the study. (See Table 8.) For the most part, the mean scores changed little from pretest to posttest, and the mean differences were not statistically significant. The one exception was for the control group in cohort 2, where the decline in the average score from pretest to posttest was -.91 and statistically significant. The emphasis on civic knowledge decreased by 6%, the effect size (Hedge’s  $g$ ) was -.55, and the improvement index was -20 percentile points. ANCOVA models comparing the difference between the adjusted PC and control group mean posttest scores were estimated for each cohort. The differences in the adjusted posttest mean scores were small and nonsignificant across the board. (See Appendix B, Table B2.)

**Table 8**  
**Civic Knowledge Objectives Index by Condition**  
**Difference of Means**

	Cohort 1		Cohort 2		Cohort 3	
	PC	Control	PC	Control	PC	Control
Pretest	14.11	14.33	14.46	15.68	16.18	14.67
Pretest SD	2.90	3.54	2.60	1.80	3.51	4.35
Posttest	14.28	14.57	14.92	14.77	16.43	14.42
Posttest SD	2.77	3.52	3.31	2.02	3.26	4.83
Difference	.16	.24	.46	-.91	.24	-.25
Sign. Difference	NS	NS	NS	.00	NS	NS
Percentage Change	1%	2%	3%	-6%	2%	-2%
Effect Size	.07	.12	.17	-.55	.10	-.06
Improvement Index	+3	+5	+6	-20	+4	-2
Pre/Post Correlation	.60	.85	.59	.66	.75	.65
Sign. Correlation	.00	.00	.00	.00	.00	.00
n	36	27	34	27	39	33

### Teachers’ Efficacy in Conveying Civic Knowledge

Teachers’ sense of self-efficacy, their belief and confidence in their ability to effectively handle the requirements of the position, has been linked to students’ achievement (Kim and Hee, 2018). Civics and social studies teachers who have greater efficacy tend to have better command over content and use more creative pedagogies to effectively convey knowledge to their classes (Calking, Yoder, and Wiens, 2021). While PC teachers tended to feel efficacious at the outset of the study, their sense of being able to successfully provide knowledge to their students increased after participating in the program for every cohort.

### Measurement

Teachers were asked how much they could do to convey content knowledge of American government to their students on the pretest and posttest. The response categories were 1 very little, 2 some, and 3 a great deal.

### Analysis

Most PC teachers—over two-thirds—felt that they were very effective in conveying content knowledge to students. (See Table 9.) There were notable increases from pretest to posttest in cohort 1 (from 76% to 95%) and cohort 3 (from 75% to 85%); the change in cohort 2 was small (from 84% to 87%). The percentage of control group teachers who indicated that they felt very effective in conveying content knowledge decreased slightly in cohorts 1 and 2. Only half of the control group teachers in cohort 3 indicated that they had a great deal faith in their

ability to convey civic content knowledge. The percentage increased to 62% on the posttest, which was still well below the norm.

**Table 9**  
**Teachers’ Efficacy in Conveying Civic Knowledge**

	Cohort 1		Cohort 2		Cohort 3	
	Pretest	Posttest	Pretest	Posttest	Pretest	Posttest
<b>Project Citizen</b>	76%	95%	84%	87%	75%	85%
<b>Control Group</b>	89%	82%	93%	89%	51%	62%

### Students’ Civic Knowledge

A primary objective of the PCRCP was to advance students’ civic knowledge through project-based learning. The evidence from this study is consistent with findings of prior research indicating that students in classes that use project-based approaches have greater gains in civic knowledge than those who take a traditional civics or social studies course. The mean post-program civic knowledge scores of middle and high school students who participated in PC were higher than those of students in standard classes. The results were statistically significant ( $p \leq .01$ ) across the board. Reflecting on their class, PC students appreciated the opportunity to experience something useful about government and politics. A middle school student stated, “Project Citizen has taught me so much about the government! I never realized how important our government is until I got an in-depth lesson about it and realized how strongly we rely on the government.” A high school student reflected: “I have thoroughly enjoyed partaking in Project Citizen. I learned a great deal about the political systems and the inner mechanisms of our government. I can proudly say, thanks to Project Citizen, I will be an active and knowledgeable participant in my community.”

### Measurement

Students’ civic knowledge was based on twenty multiple choice items relating to general knowledge of the public policy process, federalism, branches of the U.S. government, agencies and departments involved in the policy process, interest groups, and nongovernmental organizations. All of these content areas are addressed by the PC curriculum and tracked with those used in the teacher civic knowledge analysis. The items were not overly aligned with the intervention and were based on established measures with known reliability. Each item had four response categories and a “don’t know” option. One point was given for each correct item; no points were given for wrong answers or “don’t know” responses. The civic knowledge items were combined into pretest and posttest indexes. Scores on the pretest and posttest indexes ranged from 0 to 20 points. The internal consistency reliability of the indexes based on Cronbach’s  $\alpha$  was acceptable for all three cohorts. (See Table 10.)

**Table 10**  
**Student Civic Knowledge Index Range and Reliability**

	Middle School		
	Index Range	Pretest Cronbach's $\alpha$	Posttest Cronbach's $\alpha$
<b>Cohort 1</b>	0-20	.67	.66
<b>Cohort 2</b>	0-20	.63	.66
<b>Cohort 3</b>	0-20	.68	.65
	High School		
	Index Range	Pretest Cronbach's $\alpha$	Posttest Cronbach's $\alpha$
<b>Cohort 1</b>	0-20	.74	.76
<b>Cohort 2</b>	0-20	.72	.75
<b>Cohort 3</b>	0-20	.73	.77

### Analysis

Middle school students who received the PC intervention gained more civic knowledge than students in the control condition. (See Table 11.) The trend was apparent across all three cohorts, although the size of the difference varied. The knowledge scores of the PC students increased markedly from pretest to posttest. Scores improved 44% in cohort 1, 76% in cohort 2, and 66% in cohort 3. The improvement index scores were +23, +43, and +24 percentile points, respectively. In comparison, the control group students' civic knowledge gains were smaller across the board. Scores increased 33% from pretest to posttest in cohort 1, 17% in cohort 2, and 52% in cohort 3. The improvement index scores were +18, +11, and +19 percentile points.

**Table 11**  
**Middle School Students' Civic Knowledge by Condition**  
**Difference of Means**

	Cohort 1		Cohort 2		Cohort 3	
	PC	Control	PC	Control	PC	Control
Pretest $\bar{\chi}$	4.73	4.35	4.15	5.88	3.68	3.22
Pretest SD	2.91	2.68	2.43	2.96	2.73	2.67
Posttest $\bar{\chi}$	6.83	5.79	7.37	6.85	6.11	4.88
Posttest SD	3.30	3.02	3.06	3.32	3.00	2.96
$\bar{\chi}$ Difference	2.10	1.44	3.22	1.00	2.43	1.65
Sign. Difference	.00	.00	.00	.00	.00	.00
Percentage Change	44%	33%	76%	17%	66%	52%
Effect Size	.63	.48	1.51	.28	.67	.51
Improvement Index	+23	+18	+43	+11	+24	+19
Pre/Post Correlation	.44	.45	.72	.41	.22	.33
Sign. Correlation	.00	.00	.00	.00	.00	.00
n	382	390	375	461	552	449

The knowledge scores of the middle school PC intervention and control groups were not equivalent at baseline. The ANCOVA model estimates the adjusted posttest mean scores for each group and the difference of posttest means. Posttest knowledge was the dependent variable in the model, PC/control group was a fixed factor, and school and pretest knowledge were covariates. The adjusted mean posttest scores for the students who received the PC intervention were significantly higher than those of the control group across cohorts. The PC students' posttest score was 12% higher than that of the control group in cohort 1. The improvement index, computed from the effect size based on Hedge's *g*, was +10 percentile points. The PC group's adjusted posttest mean was 25% greater than the control group's mean in cohort 2 and the improvement index was +23 percentile points. In cohort 3, the percentage difference was 45% and the improvement index was +35 percentile points. In all three models, pretest knowledge was the strongest predictor of posttest knowledge. PC or control group condition was a statistically significant predictor in all of the models. The school a student attended was a significant variable only in cohort 3. (See Appendix B, Table B3.)

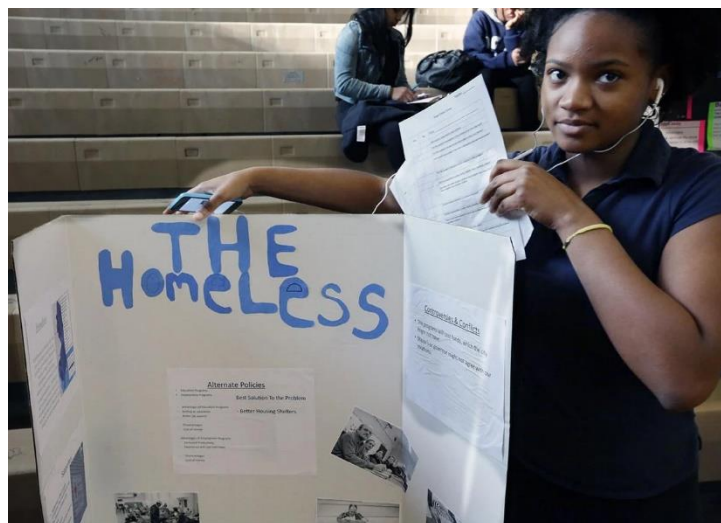
Consistent with the findings for middle school, civic knowledge gains were greater for high school students who participated in PC than for control group students in cohorts 1 and 2. (See Table 12.) The average scores of the PC students improved by 32% in cohort 1 and 56% in cohort 2. In contrast, the control group mean scores increased by 17% and 7%, respectively. The improvement index for the PC group in cohort 1 was +24 percentile points compared to +13 percentile points for the control group. In cohort 2, the improvement index for the PC group was +44 percentile points versus +4 percentile points for the control group students. The percentage change for both groups was 32% in cohort 3. However, the pretest/posttest mean difference was higher for the PC group (2.03) than the control group (1.80). The improvement index for the PC group was +22 percentile points compared to +16 percentile points for the comparison group students.

**Table 12**  
**High School Student Civic Knowledge by Condition**  
**Difference of Means**

	Cohort 1		Cohort 2		Cohort 3	
	PC	Control	PC	Control	PC	Control
Pretest $\bar{x}$	7.77	6.61	6.96	7.18	6.35	5.70
Pretest SD	3.62	3.27	3.11	3.46	3.37	3.24
Posttest $\bar{x}$	9.88	7.75	10.86	7.65	8.39	7.50
Posttest SD	3.83	3.65	3.29	4.31	3.79	3.82
$\bar{x}$ Difference	2.11	1.14	3.90	.47	2.03	1.80
Sign. Difference	.00	.00	.00	.01	.00	.00
Percentage Change	27%	17%	56%	7%	32%	32%
Effect Size	.66	.34	1.63	.12	.61	.44
Improvement Index	+24	+13	+44	+4	+22	+16
Pre/Post Correlation	.64	.54	.72	.53	.58	.35
Sign. Correlation	.00	.00	.00	.00	.00	.00
n	642	340	462	365	564	376

The ANCOVA analysis for high school students revealed statistically significant differences in adjusted mean posttest scores favoring the PC group. In cohort 1, the PC group's mean posttest score was 14% higher than that of the control group. The improvement index was +14 percentile points. The percentage difference in PC/control group scores in cohort 2 was 31% in cohort 2, with an improvement index of +35 percentile points. In cohort 3, the PC students' adjusted posttest mean score was 16% greater than that of the control group, and the improvement index was +14 percentile points. As was the case for the middle school model, pretest knowledge had the strongest relationship to posttest knowledge. PC/control group was statistically significant in all three models. School was a significant predictor in the model for cohorts 2 and 3. (See Appendix B, Table B4.)

High-need students gained civic knowledge after their participation in PC in every cohort. Paired samples t-tests were performed to estimate the mean differences between pretest and posttest knowledge scores for students of color, ELLs, students with disabilities, students performing below grade level, and students living in poverty. The percentage change in pretest/posttest mean scores, effect size (Hedge's *g*), and the improvement index were reported. (See Table 13.) The pretest/posttest improvement in civic knowledge was statistically significant ( $p \leq .05$ ) for high-need middle school students with two exceptions (ELLs in cohort 1 and students with disabilities in cohort 2). The effect size (Hedge's *g*) of the PC curriculum intervention for high-need middle school students in cohorts 1 and 2 was lower than for all students in the PC sample. In cohort 3, the effect sizes of the PC curriculum on high-need students were similar to the effect size for all PC students. The gains in high-need high school students' civic knowledge were higher than for middle school students. The knowledge gains were statistically significant for all categories of high-need students across the board. In cohorts 1 and 3, the effect sizes for high school students of color, ELLs, students with disabilities, students performing below grade level, and students living in poverty were higher than for all students in the PC sample. The findings were mixed in cohort 2. The effect sizes for students of color and living in poverty exceeded the effect size for the entire sample. The PC curriculum had a smaller effect on students performing below grade level. The findings for ELLs and students with disabilities were comparable to those for all students.





**Table 13**  
**PC Middle and High School Students' Civic Knowledge**  
**By High-Need Student Categories**  
**Based on Difference of Means Tests**

	Cohort 1		Cohort 2		Cohort 3	
	Middle School	High School	Middle School	High School	Middle School	High School
<b>Pre/Post % Change</b>						
All Students	44%	27%	76%	56%	66%	32%
Students of Color	15%	29%	43%	31%	50%	35%
English Learners	10%	37%	38%	28%	51%	35%
Students w/ Disabilities	14%	31%	4%	22%	51%	46%
Below Grade Level	15%	33%	103%	18%	53%	44%
Living in Poverty	18%	31%	57%	32%	60%	36%
<b>Effect Size</b>						
All Students	.63	.66	1.51	1.63	.67	.61
Students of Color	.30	.67	.50	.55	.61	.57
English Learners	.15 <sup>a</sup>	.79	.41	.41	.63	.55
Students w/ Disabilities	.23	.61	.05 <sup>a</sup>	.42	.64	.76
Below Grade Level	.23	.78	.67	.31	.62	.59
Living in Poverty	.33	.68	.61	.59	.69	.64
<b>Improvement Index</b>						
All Students	+23	+24	+43	+44	+22	+19
Students of Color	+12	+25	+19	+21	+23	+22
English Learners	+6	+29	+16	+16	+24	+21
Students w/ Disabilities	+19	+23	+2	+16	+24	+28
Below Grade Level	+9	+28	+25	+12	+23	+22
Living in Poverty	+13	+15	+23	+22	+25	+24

<sup>a</sup>Not statistically significant at  $p \leq .05$

## CIVIC DISPOSITIONS

Civic dispositions are the public and private traits, attitudes, and ingrained “habits of the heart” that are consistent with the common good and are central to the functioning of a healthy democracy (Tocqueville, 1838; Branson, 1998; Crittenden and Levine, 2018). The Campaign for the Civic Mission of Schools (2011) defines civic dispositions as a concern for others' rights and welfare, fairness, reasonable levels of trust, and a sense of public duty. These traits are innate to a sense of civic responsibility. People who evince a strong democratic temperament are willing to compromise personal interests for the greater good (Stambler, 2011). They embrace their democratic rights, responsibilities, and duties in a responsible, tolerant, and civil manner. They have the confidence to engage in civic affairs and to participate actively in political life (Torney-Purta and Amadeo, 2017). Civic dispositions include respect for the rule of law, a commitment to justice, equality, and fairness, trust in government, civic duty, attentiveness to political matters, political efficacy, political tolerance, respect for human rights, concern for the welfare of others, civility, social responsibility, and community connectedness (Morgan and Streb, 2001; Torney-Purta and Lopez, 2006; Campaign for the Civic Mission of Schools, 2011; National Council for the Social Studies, 2013). These dispositions enable people to become independent members of society who accept the moral and legal obligations of a democracy and take personal responsibility for their actions (Kahne, et al., 2006). They encourage thoughtful and effective participation in civic affairs. They require citizens to keep informed about politics and government, monitor political leaders and public agencies to ensure their actions are principled, and work through peaceful, legal means to change unjust policies (Branson, 1998).

### Teacher Instructional Objectives: Developing Civic Dispositions

Civics instruction in elementary and secondary school can impart lasting democratic proclivities and prime citizenship orientations that develop over a lifetime (Pasek et al., 2008; Kahne and Spote, 2008). Educating students about civic dispositions provides an instructional opportunity that can be a gateway for making civic knowledge relevant and compelling (Muetterties, DiGiacomo, and New, 2022). In project-based learning, a deliberate focus on dispositions can deepen students' understanding of the reasons behind their civic engagement and create a more authentic experience (Levinson and Levine, 2013). Despite these possibilities, civic dispositions often are sidelined in the curriculum. Most teachers desire to have their students develop into good global citizens who are active and productive members of their community (Kavanagh and Rich, 2018). However, they are hindered in this pursuit by the emphasis on standardized testing that prioritizes memorization of content knowledge (Hansen, et al., 2018; Gewertz, 2019). In addition, civic dispositions are more difficult to convey to students than factual knowledge (Jamieson, 2013; Hansen, et al., 2018). These trends are reflected in the fact that less than 20% of civic education studies focus on civic dispositions (Fitzgerald, et al., 2021).

A central aim of the PCRCP was to develop students' civic dispositions. This objective was a central theme in the Center's teacher PD program at the summer institutes and the follow-up sessions. Consistent with the assumptions of prior research, teachers in the PC and control

groups did not place a great deal of emphasis on developing students' civic dispositions on the pretest. After participating in the PCRCP, teachers were more inclined to accentuate civic dispositions in their lessons. This change was not found for the control group teachers.

## Measurement

Teachers were asked on the pre- and post-program surveys how much emphasis they placed on developing students' dispositions to become involved in community affairs. The response categories were 1 not much, 2 some, and 3 a great deal.

## Analysis

PC teachers reported that they emphasized civic dispositions more in their classes after participating in the program. (See Table 14.) The percentage of PC teachers indicating that they did not place much emphasis on dispositions declined from pretest to posttest while the percentage answering "a great deal" increased markedly. In cohort 1, 30% of PC teachers responded "not much" on the pretest compared to 8% on the posttest. There was a shift from 21% to 46% of PC teachers who placed a great deal of emphasis on dispositions. In cohort 2, the percentage of PC teachers indicating "not much" changed from 25% on the pretest to 6% on the posttest. The percentage who placed a great deal of emphasis on civic disposition increased from 21% to 50%. In cohort 3, 48% of PC teachers answered that they did not emphasize dispositions much on the pretest compared to 28% on the posttest. The number who paid a great deal of attention to dispositions increased from 17% to 32%. The increase in teachers' reported emphasis on civic dispositions found for the PC group was not evident for the control group. The percentage of control group teachers responding "a great deal" remained constant at 26% in cohort 1, decreased from 30% to 25% in cohort 2, and went from 15% to 11% in cohort 3. The percentage of control group teachers who indicated that they did not place much emphasis on civic dispositions remained constant at 26% in cohort 1. The number who responded "not much" increased in cohort 2 from 22% to 31% and in cohort 3 from 47% to 68%.



**Table 14**  
**Teachers' Emphasis on Civic Dispositions**

<b>Project Citizen Teachers</b>						
	<b>Cohort 1</b>		<b>Cohort 2</b>		<b>Cohort 3</b>	
	<b>Pretest</b>	<b>Posttest</b>	<b>Pretest</b>	<b>Posttest</b>	<b>Pretest</b>	<b>Posttest</b>
A Great Deal	21%	46%	21%	58%	17%	32%
Some	49%	46%	54%	36%	35%	40%
Not Much	30%	8%	25%	6%	48%	28%
n	36	36	34	34	39	39

<b>Control Group Teachers</b>						
	<b>Cohort 1</b>		<b>Cohort 2</b>		<b>Cohort 3</b>	
	<b>Pretest</b>	<b>Posttest</b>	<b>Pretest</b>	<b>Posttest</b>	<b>Pretest</b>	<b>Posttest</b>
A Great Deal	26%	26%	30%	25%	15%	11%
Some	33%	39%	48%	44%	38%	21%
Not Much	41%	35%	22%	31%	47%	68%
n	27	27	27	27	33	33

Paired sample t-tests indicated that PC teachers mean scores on the civic dispositions indicator increased significantly from pretest to posttest in all study years. (See Table 15.) The pretest/posttest mean differences were .40, .52, and .28. The percentage change was 20% in cohort 1, 26% in cohort 2, and 17% in cohort 2. The effect sizes (Hedge's g) were .38, .74, and .29 corresponding to improvement index scores of +15, +27, and +11 percentile points. The pretest/posttest mean difference for the control group was only statistically significant in cohort 3, and the change was negative.

**Table 15**  
**Developing Civic Dispositions by Condition**  
**Difference of Means**

Developing dispositions to become involved in community affairs	<b>Cohort 1</b>		<b>Cohort 2</b>		<b>Cohort 3</b>	
	<b>PD</b>	<b>Control</b>	<b>PD</b>	<b>Control</b>	<b>PD</b>	<b>Control</b>
Pretest $\bar{x}$	1.96	1.82	2.00	2.18	1.67	1.71
Pretest SD	.67	.83	.68	.73	.74	.71
Posttest $\bar{x}$	2.36	1.91	2.52	1.95	1.95	1.50
Posttest SD	.62	.79	.62	.78	.77	.74
$\bar{x}$ Difference	.40	.09	.52	-.23	.28	-.21
Sign. Difference	.00	NS	.00	NS	.04	.05
Percentage Change	20%	5%	26%	-11%	17%	-12%
Effect Size	.38	.09	.74	-.27	.29	-.30
Improvement Index	+15	+3	+27	-10	+11	-12
Pre/Post Correlation	.04	.85	.47	.43	.30	.56
Sign. Correlation	NS	.00	.00	.02	.03	.00
n	36	27	34	27	39	33

## Student Civic Dispositions

Students' development of civic dispositions was a focal outcome of the PCRCP. Students who participated in PC became more inclined to keep informed about government and to be attentive to policy issues. Their sense of their responsibility to vote if given the opportunity became more robust over time. A middle school PC student noted, "I learned a lot from this class because I did not know anything about our government and many other things. I think it was very important to take this class because it will prepare us for the future to participate in voting." A high school student stated, "Project Citizen has taught me so much about the government! I never realized how important our government is until I got an in-depth lesson about it and realized how strongly we rely on the government. It is important for us to vote and be involved." Students exhibited low levels of trust in government and the media commensurate with current pervasive trends nationally. High school students' trust increased slightly after PC, especially their faith in the media.

## Civic Responsibility

Civic responsibility is a broad term that encompasses traits associated with good citizenship, civic duty, and civic engagement. It can be defined as "active participation in the public life of a community in an informed, committed, and constructive manner, with a focus on the common good" (Larson-Keagy, 2022: 16). People with a strong sense of civic responsibility embrace the concept of participatory democracy, understand what constitutes the common good, and can find a fair balance between rights and responsibilities. They are politically aware, involved in community decision-making, and act to promote positive change. They recognize the value and dignity of all people (Gottlieb and Robinson, 2002).

An index measuring students' civic responsibility encompassed their propensity to keep informed and actively engage in their community was created. There were no statistically significant improvements in middle school students' civic responsibility index scores over the course of the study for both the PC and control groups. There were modest, statistically significant increases in civic responsibility for high school students who participated in PC. The findings were weaker for the control group students.

## Measurement

A civic responsibility index was created from two measures that asked students how much of a responsibility they felt to 1) follow news about government every day and 2) get actively involved in their community. The response options were 1 not much responsibility, 2 a great deal of responsibility, and 3 a top priority. The additive index ranged from 1 (not much responsibility) to 5 (a top priority). The index reliability (Cronbach's  $\alpha$ ) was acceptable across the cohorts. (See Table 16.)

**Table 16**  
**Civic Responsibility Index Range and Reliability**

	<b>Middle School</b>		
	<b>Index Range</b>	<b>Pretest Cronbach's <math>\alpha</math></b>	<b>Posttest Cronbach's <math>\alpha</math></b>
<b>Cohort 1</b>	1-5	.65	.66
<b>Cohort 2</b>	1-5	.70	.70
<b>Cohort 3</b>	1-5	.64	.65
	<b>High School</b>		
	<b>Index Range</b>	<b>Pretest Cronbach's <math>\alpha</math></b>	<b>Posttest Cronbach's <math>\alpha</math></b>
<b>Cohort 1</b>	1-5	.66	.72
<b>Cohort 2</b>	1-5	.69	.73
<b>Cohort 3</b>	1-5	.65	.72

### Analysis

Middle school students' sense of their responsibility to keep informed and become actively engaged in the community did not change over the course of the study. (See Table 17.) Students' average scores on the pretest and posttest hovered around 2.00, which is below the midpoint of the index. The pretest/posttest difference in mean scores on the civic duty index was not statistically significant for the PC or the control group students for all three cohorts. The ANCOVA analysis compared the adjusted posttest means of the middle school PC and control group students. There were virtually no differences in the adjusted posttest mean scores between the groups for any of the cohorts. (See Appendix B, Table B5.)

**Table 17**  
**Middle School Students' Civic Responsibility by Condition**  
**Difference of Means**

	<b>Cohort 1</b>		<b>Cohort 2</b>		<b>Cohort 3</b>	
	<b>PC</b>	<b>Control</b>	<b>PC</b>	<b>Control</b>	<b>PC</b>	<b>Control</b>
	1.92	2.06	1.99	2.02	1.92	1.85
Pretest $\bar{x}$	1.09	1.22	1.21	1.22	1.14	1.11
Pretest SD	1.97	1.97	2.03	1.95	1.98	1.94
Posttest $\bar{x}$	1.09	1.17	1.22	1.14	1.13	1.12
Posttest SD	.05	-.09	.04	-.07	.05	.09
$\bar{x}$ Difference	NS	NS	NS	NS	NS	NS
Percentage Change	3%	-4%	2%	-3%	3%	4%
Effect Size	.04	-.06	.03	-.05	.04	.06
Improvement Index	+2	-2	+1	-2	+2	+6
Pre/Post Correlation	.31	.32	.36	.31	.31	.25
Sign. Correlation	.00	.00	.00	.00	.00	.00
n	303	346	334	421	471	344

Small, statistically significant gains in a sense of civic responsibility were found for high school students who participated in PC. (See Table 18.) As was the case for middle schoolers, the mean scores for high school students were positioned below the midpoint of the index. The effect size for PC students increased for each subsequent cohort, ranging from .07 in cohort 1, .16 in cohort 2, and .22 in cohort 3. The improvement index scores were +3, +6, and +9 percentile points. The control group pretest/posttest mean difference was nonsignificant in cohort 1 and was smaller than for the PC group in cohorts 2 and 3. The results of the ANCOVA analysis showed that the adjusted posttest difference of means for the high school PC and control group students were minimal and nonsignificant for all three cohorts. (See Appendix B, Table B6.)

**Table 18**  
**High School Students' Civic Responsibility by Condition**  
**Difference of Means**

	Cohort 1		Cohort 2		Cohort 3	
	PC	Control	PC	Control	PC	Control
Pretest $\bar{x}$	2.09	2.15	1.86	1.97	1.77	1.80
Pretest SD	1.15	1.27	1.12	1.11	1.03	1.04
Posttest $\bar{x}$	2.18	2.14	2.06	2.10	2.07	2.05
Posttest SD	1.26	1.29	1.19	1.27	1.26	1.18
$\bar{x}$ Difference	.09	-.01	.20	.13	.29	.24
Sign. Difference	.05	NS	.00	.04	.00	.00
Percentage Change	4%	<1%	11%	6%	17%	14%
Effect Size	.07	.01	.16	.10	.22	.18
Improvement Index	+3	0	+6	+4	+9	+7
Pre/Post Correlation	.43	.47	.42	.38	.37	.32
Sign. Correlation	.00	.00	.00	.00	.00	.00
n	639	293	426	312	523	328

### Attention to Issues

The PC curriculum has students identify a problem to work on in their community or school which requires that they become aware of issues that need to be addressed. Middle school students in cohorts 1 and 3 tended to pay significantly greater attention to issues following their PC experience. A PC middle school student stated, “It’s interesting to know that someone is concerned about a teen’s views about politics. Personally, I didn’t care about government-related or political stuff, but in the future, I can see myself becoming more aware.” A high school student commented, “Project Citizen has honestly made me think more deeply and delve into politics more and more.” Control group students’ issue attention tended to decline over time.

### Measurement

Two items measured students’ attention to issues before and after their PC or traditional civics class: 1) How much attention do you pay to issues that are affecting your community? and

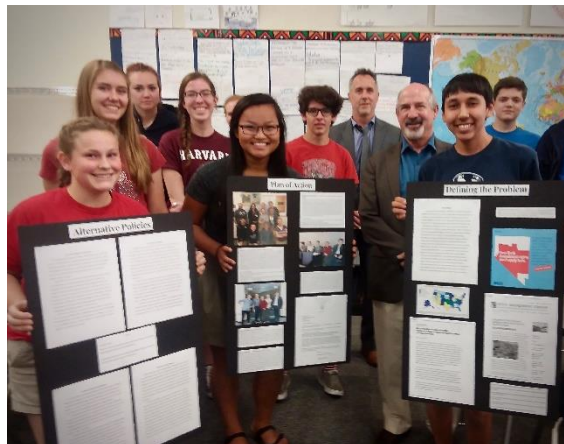
2) How much attention do you pay to issues that are affecting your school? The response categories were 1 not very much attention, 2 some attention, and 3 a lot of attention. The two items were added to form an attention index which ranged from 1 (not much attention) to 5 (a lot of attention). The reliability (Cronbach's  $\alpha$ ) was acceptable across the three cohorts. (See Table 19.)

**Table 19**  
**Attention Index Range and Reliability**

	Middle School		
	Index Range	Pretest Cronbach's $\alpha$	Posttest Cronbach's $\alpha$
<b>Cohort 1</b>	1-5	.69	.62
<b>Cohort 2</b>	1-5	.61	.68
<b>Cohort 3</b>	1-5	.59	.61
	High School		
	Index Range	Pretest Cronbach's $\alpha$	Posttest Cronbach's $\alpha$
<b>Cohort 1</b>	1-5	.67	.67
<b>Cohort 2</b>	1-5	.66	.71
<b>Cohort 3</b>	1-5	.65	.68

### Analysis

Middle school students' average levels of issue attentiveness were near the midpoint of the attention scale. Middle schoolers participating in PC became significantly more attentive to issues in their community and school in cohorts 1 and 3. (See Table 20.) The gains were small, with pretest/posttest mean differences of .14 and .10 and corresponding percentage changes of 4% and 3%. The effect sizes (Hedge's  $g$ ) were .12 and .08, and the improvement index scores were +5 and +3. Attention to issues decreased significantly among the control group middle school students in every cohort. The pretest/posttest mean differences were -.22, -.20, and -.19. The mean values decreased by 9%, 6%, and 6%. The effect sizes were -.22, -.16, and -.13, which corresponded to improvement index scores of -9, -6, and -5. The ANCOVA analysis found that the adjusted posttest means of the PC middle school students were significantly higher than those of the control group students in cohort 1, but not in cohorts 2 and 3. (See Appendix B, Table B7.)

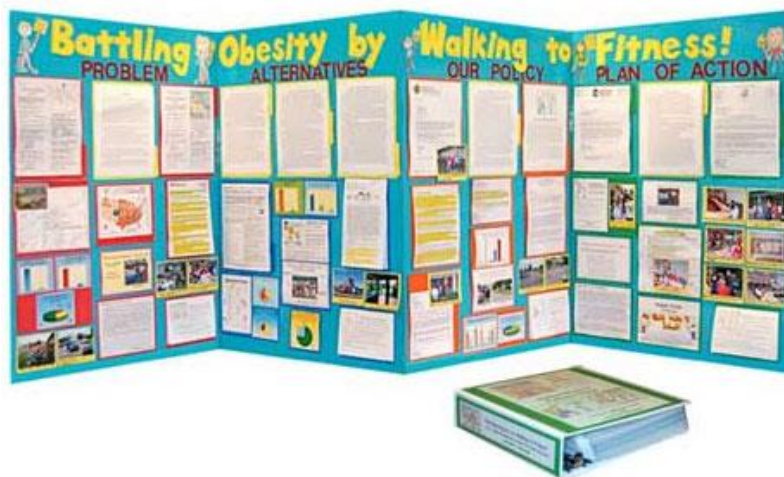




**Table 20**  
**Middle School Students' Attention to Issues by Condition**  
**Difference of Means**

	Cohort 1		Cohort 2		Cohort 3	
	PC	Control	PC	Control	PC	Control
Pretest $\bar{x}$	3.19	3.24	3.17	3.26	2.98	3.12
Pretest SD	1.11	1.17	1.19	1.20	1.12	1.12
Posttest $\bar{x}$	3.33	2.95	3.13	3.06	3.08	2.93
Posttest SD	1.11	1.19	1.17	1.15	1.11	1.11
$\bar{x}$ Difference	.14	-.28	-.04	-.20	.10	-.19
Sign. Difference	.00	.00	NS	.00	.03	.01
Percentage Change	4%	-9%	-1%	-6%	3%	-6%
Effect Size	.12	-.22	-.03	-.16	.08	-.13
Improvement Index	+5	-9	-1	-6	+3	-5
Pre/Post Correlation	.47	.38	.32	.41	.30	.21
Sign. Correlation	.00	.00	.00	.00	.00	.00
n	341	353	357	447	518	393

High school students' mean scores on issue attentiveness were near the midpoint of the index. (See Table 21.) PC students' attention to issues increased significantly in cohorts 1 and 3, but not in cohort 2. The pretest/posttest mean differences were small at .09 for cohort 1 and .11 for cohort 3. The percentage increase was 3% and 4%, respectively. The effect sizes (Hedge's  $g$ ) were .08 and .09, which corresponded to improvement index scores of +3 and +4 percentile points. The high school control group pretest/post mean difference was only statistically significant in cohort 1 where the average attention to issues declined. The mean difference was -.26, the percentage change was -8%, the effect size was -.21, and the improvement index score was -.8 percentile points. The ANCOVA analysis established that there were no statistically significant differences in adjusted mean posttest scores between the PC and control groups for any cohort. (See Appendix B, Table B8.)



**Table 21**  
**High School Students' Attention to Issues by Condition**  
**Difference of Means**

	Cohort 1		Cohort 2		Cohort 3	
	PC	Control	PC	Control	PC	Control
Pretest $\bar{x}$	3.23	3.37	3.10	3.25	2.90	2.90
Pretest SD	1.16	1.13	1.21	1.14	1.12	1.08
Posttest $\bar{x}$	3.32	3.10	3.15	3.18	3.01	2.98
Posttest SD	1.18	1.18	1.16	1.19	1.14	1.12
$\bar{x}$ Difference	.09	-.26	.05	-.07	.11	.07
Sign. Difference	.02	.00	NS	NS	.02	NS
Percentage Change	3%	-8%	2%	-2%	4%	3%
Effect Size	.08	-.21	.03	-.05	.09	.06
Improvement Index	+3	-8	+1	-2	+4	+4.
Pre/Post Correlation	.48	.41	.44	.34	.36	.29
Sign. Correlation	.00	.00	.00	.00	.00	.00
n	648	306	450	335	542	346

### Duty to Vote

Middle and high school students generally had a strong sense of duty to vote prior to taking their PC or traditional civics class. Still, PC students' sense of duty to vote increased significantly after participating in the program for all three cohorts. For the most part, the control group middle and high school students' sense of duty to vote did not change from pretest to posttest.

### Measurement

Students were asked how responsible they felt to exercise their right to vote in election if they were eligible. The item was coded 1 not much responsibility, 2 a great deal of responsibility, and 3 a top priority.

### Analysis

Middle school students' sense of their duty to vote was high from the outset for PC and control group students. (See Table 22.) The percentage of PC middle schoolers indicating that their responsibility to vote was a top priority was 28% in all three cohorts. The number increased to 39% in cohort 1 and 36% in cohorts 2 and 3. The percentage of PC students indicating that they didn't have much responsibility to vote declined in each study year. In contrast, there was little change from pretest to posttest for the control group middle school students.

**Table 22**  
**Middle School Students' Duty to Vote**

<b>Project Citizen Middle School Students</b>						
Duty to Vote	Cohort 1		Cohort 2		Cohort 3	
	Pretest	Posttest	Pretest	Posttest	Pretest	Posttest
A Top Priority	28%	39%	28%	36%	28%	36%
A Great Deal	39%	38%	38%	35%	37%	35%
Not Much	33%	23%	34%	29%	35%	29%
n	341	341	357	357	518	518

<b>Control Group Middle School Students</b>						
Duty to Vote	Cohort 1		Cohort 2		Cohort 3	
	Pretest	Posttest	Pretest	Posttest	Pretest	Posttest
A Top Priority	29%	31%	30%	30%	30%	32%
A Great Deal	40%	39%	36%	41%	36%	37%
Not Much	31%	31%	34%	29%	34%	31%
n	353	353	447	447	518	518

Difference of means tests indicated that the PC students' average scores on duty to vote improved significantly from pretest to posttest across all cohorts. (See Table 23.) The percentage change for the PC group were 10%, 6%, and 10%, respectively. The effect sizes (Hedge's g) were small at .24, .14, and .19. The corresponding improvement index scores were +9, +6, and +8 percentile points. The pretest/posttest differences in duty to vote for the control group were negligible and nonsignificant across the board. The ANCOVA model found a statistically significant difference in the adjusted mean posttest scores between the middle school PC and control group students in cohort 1. The PC group's adjusted mean score was higher than that of the control group. The percentage difference was 7%, the effect size (Hedge's g) was .19, and the improvement index was +8 percentile points. The adjusted mean differences between the PC and control group scores were small and nonsignificant for cohorts 2 and 3. (See Appendix B, Table B9.)



**Table 23**  
**Middle School Students' Duty to Vote by Condition**  
**Difference of Means**

	Cohort 1		Cohort 2		Cohort 3	
	PC	Control	PC	Control	PC	Control
Pretest $\bar{x}$	1.97	1.98	1.93	1.98	1.73	1.72
Pretest SD	.77	.77	.78	.81	.75	.76
Posttest $\bar{x}$	2.17	2.02	2.05	2.02	1.91	1.76
Posttest SD	.77	.77	.81	.78	.78	.72
$\bar{x}$ Difference	.19	.04	.12	.04	.18	.04
Sign. Difference	.00	NS	.00	NS	.00	NS
Percentage Change	10%	2%	6%	2%	10%	2%
Effect Size	.24	.04	.14	.04	.19	.04
Improvement Index	+9	+2	+6	+2	+8	+2
Pre/Post Correlation	.44	.41	.39	.39	.25	.19
Sign. Correlation	.00	.00	.00	.00	.00	.00
n	308	348	349	431	502	374

High school students were more inclined to consider voting a top priority than middle school students as the prospect of voting was imminent for them. (See Table 24.) The percentage of PC high school students who prioritized voting increased in each study year. The number of PC high schoolers responding “a top priority” rose from 45% to 52% in cohort 1 and from 37% to 39% in cohorts 2 and 3 while the percentage indicating “not much” dropped. The control group high school students prioritized voting less from pretest to posttest in cohort 1. The percentages remained relatively stable in cohorts 2 and 3.

**Table 24**  
**Middle School Students' Duty to Vote**

Project Citizen High School Students						
	Cohort 1		Cohort 2		Cohort 3	
	Pretest	Posttest	Pretest	Posttest	Pretest	Posttest
A Top Priority	45%	52%	37%	39%	37%	39%
A Great Deal	35%	32%	35%	40%	34%	39%
Not Much	20%	16%	28%	21%	29%	22%
n	648	648	450	450	542	542

Control Group High School Students						
	Cohort 1		Cohort 2		Cohort 3	
	Pretest	Posttest	Pretest	Posttest	Pretest	Posttest
A Top Priority	47%	43%	34%	35%	34%	35%
A Great Deal	33%	34%	43%	40%	43%	40%
Not Much	20%	23%	23%	25%	23%	25%
n	306	306	335	335	346	346

On average, high school students in both the PC and control group felt a great deal of responsibility to vote prior to their civics classes. (See Table 25.) The PC groups' mean scores on duty to vote increased slightly from pretest to posttest. The difference of means was statistically significant for cohorts 1 and 3; it approached significance for cohort 2. The control group differences were nonsignificant for cohorts 1 and 2. In cohort 3, the pretest/posttest improvement in mean scores on duty to vote was slightly higher for the control group than the PC group. The ANCOVA analysis showed that the difference in adjusted posttest mean scores on duty to vote was higher for the PC group than the control group. The difference of adjusted means was statistically significant for cohort 1, approached significance for cohort 2, and was nonsignificant for cohort 3. While the effect sizes are small, the improvement index scores are +6, +9, and +10 percentile points. (See Appendix B, Table B10.)

**Table 25**  
**High School Students' Duty to Vote by Condition**  
**Difference of Means**

	Cohort 1		Cohort 2		Cohort 3	
	PC	Control	PC	Control	PC	Control
Pretest $\bar{x}$	2.27	2.27	2.09	2.11	2.06	1.93
Pretest SD	.76	.77	.80	.74	.77	.79
Posttest $\bar{x}$	2.34	2.22	2.15	2.11	2.15	2.04
Posttest SD	.75	.78	.77	.77	.77	.80
$\bar{x}$ Difference	.07	-.05	.06	.00	.09	.11
Sign. Difference	.01	NS	.09	NS	.01	.01
Percentage Change	3%	-2%	3%	0%	4%	6%
Effect Size	.09	-.06	.06	.00	.10	.11
Improvement Index	+4	-2	+2	.00	+4	+4
Pre/Post Correlation	.46	.37	.49	.42	.36	.35
Sign. Correlation	.00	.00	.00	.00	.00	.00
n	641	294	441	322	537	343

## Future Government Service

In general, middle school students were only modestly interested in a career in government and politics or running for office one day. Middle school students in both the PC and control groups were no more likely to desire a career in government service at the conclusion of the study than they had been at the outset, with one exception. In contrast, high school PC students became significantly more interested in pursuing a future career in government service after participating in the program. This finding is not surprising given that government service is a more compelling option for high school students who may soon be entering the workforce.

## Measurement

Students were asked how much they agreed on two items related to their interest in government service: 1) I am interested in a career in government and politics and 2) I may run

for office one day. The response categories were 1 strongly disagree, 2 disagree, 3 neither agree nor disagree, 4 agree, 5 strongly agree. The items were combined to form a government service index that ranged from 1 (not interested) to 9 (very interested). The index reliability (Cronbach's  $\alpha$ ) was acceptable for all cohorts. (See Table 26.)

**Table 26**  
**Attention Index Range and Reliability**

	<b>Middle School</b>		
	<b>Index Range</b>	<b>Pretest Cronbach's <math>\alpha</math></b>	<b>Posttest Cronbach's <math>\alpha</math></b>
<b>Cohort 1</b>	1-9	.77	.81
<b>Cohort 2</b>	1-9	.80	.79
<b>Cohort 3</b>	1-9	.77	.80
	<b>High School</b>		
	<b>Index Range</b>	<b>Pretest Cronbach's <math>\alpha</math></b>	<b>Posttest Cronbach's <math>\alpha</math></b>
<b>Cohort 1</b>	1-9	.84	.84
<b>Cohort 2</b>	1-9	.86	.87
<b>Cohort 3</b>	1-9	.82	.84

## Analysis

Middle school students' means scores on the government service index were in the bottom third of the scale. Few students expressed a strong interest in having a career in government and politics or one day running for office. (See Table 27.) There were no differences in the pretest/posttest mean values for either the PC or control group students in cohort 1. PC students in cohort 2 became more interested in government service after participating in the program. The difference in pretest/posttest means of .32 was statistically significant and represented a 9% increase. The effect size (Hedge's  $g$ ) was .14 which corresponded to an improvement index score of +6 percentile points. The control group means did not change from pretest to posttest. In cohort 3, the small pretest/posttest mean difference was not statistically significant. However, the mean difference of .27 for the control group was statistically significant. The percentage change was 8%, the effect size was .11, and the improvement index was +4 percentile points. The ANCOVA analysis of middle school students' future government service found a statistically significant difference between the PC and control group adjusted posttest means for cohort 2. The adjusted posttest mean was .42 in favor of the PC group. There was an 11% difference between the group means. The effect size was .20 and the improvement index score was +8 percentile points. (See Appendix B, Table B11.)

**Table 27**  
**Middle School Students' Interest in Government Service by Condition**  
**Difference of Means**

	Cohort 1		Cohort 2		Cohort 3	
	PC	Control	PC	Control	PC	Control
Pretest $\bar{x}$	3.35	3.33	3.70	3.65	3.74	3.52
Pretest SD	2.10	2.04	2.16	2.01	2.15	2.10
Posttest $\bar{x}$	3.35	3.30	4.02	3.65	3.84	3.80
Posttest SD	2.08	2.01	2.10	2.13	2.22	2
$\bar{x}$ Difference	.00	-.03	.32	.00	.10	.27
Sign. Difference	NS	NS	.00	NS	NS	.03
Percentage Change	0	<-1%	9%	0	3%	8%
Effect Size	0	-.02	.14	0	.04	.11
Improvement Index	0	-1	+6	0	+2	+4
Pre/Post Correlation	.46	.45	.47	.47	.39	.27
Sign. Correlation	.00	.00	.00	.00	.00	.00
n	321	343	338	424	493	343

High school students' interest in future government service was similar to that of middle school students at the outset. The average scores were in the lower third of the index range across the three cohorts. (See Table 28.) However, interest in government service increased significantly for both the PC and control group students over the course of the study. The change was greater for the PC group than the control group across the board. The difference was smallest in cohort 1. The pretest/posttest mean difference for the PC group was .26, the percentage change was 8%, the effect size was .13, and the improvement index score was +5. The control group mean difference was .20, the percentage change was 6%, the effect size was .10, and the improvement index score was +4 percentile points. The pretest/posttest mean differences for the PC groups in cohorts 2 and 3 were .61 and .75, respectively. In cohort 2, the PC group had a 20% increase in means from pretest to posttest, an effect size of .27, and an improvement index of +11 percentile points. In cohort 3, there was a 24% increase in pretest/posttest mean values, the effect size was .31, and the improvement index score was +12 percentile points. The pretest/posttest mean for the control groups increased by 12% in cohort 2 and 9% in cohort 3. The effect sizes were .16 and .12 which corresponded to improvement index scores of +6 and +5. The ANCOVA analysis confirmed that the small difference in adjusted posttest means in cohort 1 was not statistically significant. The PC high school students' adjusted posttest means were significantly higher than those of the control group in cohorts 2 and 3. (See Appendix B, Table B12.)

**Table 28**  
**High School Students' Future Government Service by Condition**  
**Difference of Means**

	Cohort 1		Cohort 2		Cohort 3	
	PC	Control	PC	Control	PC	Control
Pretest $\bar{x}$	3.45	3.31	3.07	3.03	3.11	3.23
Pretest SD	2.25	2.11	2.06	2.15	2.03	2.09
Posttest $\bar{x}$	3.72	3.51	3.68	3.38	3.86	3.52
Posttest SD	2.33	2.23	2.32	2.28	2.41	2.23
$\bar{x}$ Difference	.26	.20	.61	.34	.75	.28
Sign. Difference	.00	.01	.00	.00	.00	.00
Percentage Change	8%	6%	20%	12%	24%	9%
Effect Size	.13	.10	.27	.16	.31	.12
Improvement Index	+5	+4	+11	+6	+12	+5
Pre/Post Correlation	.61	.62	.46	.53	.39	.43
Sign. Correlation	.00	.00	.00	.00	.00	.00
n	641	294	437	322	528	339

## Trust in Government

Public trust in government has been on the decline for decades. Military conflicts, scandals involving institutions and officials, negative perceptions of the economy, fear of crime, concerns with domestic issues are some of the factors contributing to plummeting trust (Chanley, Rudolph, and Rahn, 2000; Gershon, 2016). The media's negative and sensational coverage of government and politics contributes to the public's negative views (Kavanagh, et al., 2020). Despite a slight uptick during the first two years of the pandemic, less than one-fifth of Americans felt that they could trust the government in Washington to do what is right most of the time during the period of this study (Pew Research Center, 2023). Middle school students in the PC and control groups exhibited low levels of trust in government which persisted from pretest to posttest. PC high school students' trust in government increased significantly in cohorts 1 and 3.

## Measurement

Trust in government was measured by the item: I trust government officials to do what is right most of the time. The response categories were 1 strongly disagree, 2 disagree, 3 neither agree nor disagree, 4 agree, 5 strongly disagree.

## Analysis

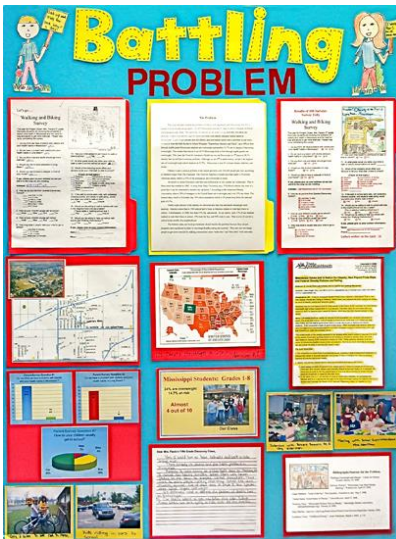
Middle school students' trust in government remained stable over the course of the study for both the PC and control group students. (See Table 29.) The mean scores hovered around 3, which was in the middle of the distribution. The ANCOVA analysis found no statistically significant differences in the adjusted posttest mean scores on trust in government between the middle school PD and control groups. (See Appendix B, Table B13.)



**Table 29**  
**Middle School Students' Trust in Government by Condition**  
**Difference of Means**

	Cohort 1		Cohort 2		Cohort 3	
	PC	Control	PC	Control	PC	Control
Pretest $\bar{x}$	3.13	3.03	3.16	3.01	3.07	2.96
Pretest SD	1.00	1.02	1.01	.98	1.03	1.02
Posttest $\bar{x}$	3.14	2.99	3.25	2.98	3.14	2.98
Posttest SD	.98	1.03	.97	.96	1.07	1.06
$\bar{x}$ Difference	.01	-.04	.09	-.03	.07	.02
Sign. Difference	NS	NS	NS	NS	NS	NS
Percentage Change	0%	-1%	3%	-1%	2%	1%
Effect Size	.00	-.03	.08	-.03	.05	.01
Improvement Index	0	-1	+3	-1	+2	0
Pre/Post Correlation	.32	.40	.34	.35	.25	.20
Sign. Correlation	.00	.00	.00	.00	.00	.00
n	304	342	339	423	496	360

The average levels of trust in government were slightly lower for high school students than middle school students on the pretest and were below the midpoint of the scale. The mean levels of trust for high school students who participated in PC increased significantly in cohorts 1 and 3. (See Table 30.) The pretest/posttest mean difference in cohort 1 was .12, with a 5% improvement in trust. The effect size (Hedge's *g*) was .11 and the improvement index score was +4 percentile points. The increase was larger for PC students in cohort 3, with a pretest/posttest mean difference of .22 and a percentage change of 8%. The effect size was .18 and the improvement index was +7. The results of the ANCOVA analysis showed no statistically significant differences in the adjusted posttest means of the PC and control groups for any cohort. (See Appendix C, Table B14.)



**Table 30**  
**High School Students' Trust in Government by Condition**  
**Difference of Means**

	Cohort 1		Cohort 2		Cohort 3	
	PC	Control	PC	Control	PC	Control
Pretest $\bar{x}$	2.76	2.87	2.78	2.85	2.71	2.72
Pretest SD	.99	1.17	1.03	1.00	.99	1.02
Posttest $\bar{x}$	2.89	2.83	2.85	2.91	2.94	2.76
Posttest SD	1.00	1.15	1.01	1.04	1.06	1.03
$\bar{x}$ Difference	.12	-.04	.06	.06	.22	.04
Sign. Difference	.00	NS	NS	NS	.00	NS
Percentage Change	5%	-1%	3%	2%	8%	1%
Effect Size	.11	-.04	.05	.06	.18	.03
Improvement Index	+4	-2	+2	+2	+7	+1
Pre/Post Correlation	.38	.50	.37	.39	.33	.42
Sign. Correlation	.00	.00	.00	.00	.00	.00
n	634	289	434	319	529	360

## Trust in Media

The public's trust in media reached historic lows in 2020, when the percentage of people with no trust in the news surpassed that of people with at least some confidence. Trust in the media remained low throughout the COVID-19 pandemic even as people's reliance on the news increased. The public feels that the media are not fulfilling their role in democracy to provide accurate information that they can use in decision making. People have difficulty sorting the facts from the glut of misinformation they receive. The perception that reporting is inaccurate, the news reflects deep partisan biases, and that news organizations' business priorities overwhelm their public service imperative is driving down media trust. Half of Americans believe that the news media deliberately sets out to deceive them (Knight Foundation, 2023). Young people now get most of their news from social media and trust it more than national news media (Liedke and Gottfried, 2022).

While students in the study had low levels of trust in government, they trusted the news media even less. Middle school students' distrust remained constant over time. High school students' trust in the news media increased slightly. The increase was greater than for trust in government.

## Measurement

Trust in media was measured by students' agreement with the statement: I trust the news media. The response categories were 1 strongly disagree, 2 disagree, 3 neither agree nor disagree, 4 agree, 5 strongly agree.

## Analysis

PC and control group middle school students' trust in the media was somewhat lower than their trust in government. The mean levels of trust remained consistent from pretest to posttest for the PC group. (See Table 31.) None of the PC groups' pretest/posttest mean differences were statistically significant. There was a slight, statistically significant decline in media trust for the control groups in cohorts 2 and 3. The ANCOVA analysis found no statistically significant differences in the adjusted posttest means between the middle school PC and control groups. (See Appendix B, Table B15.)

**Table 31**  
**Middle School Students' Media Trust by Condition**  
**Difference of Means**

	Cohort 1		Cohort 2		Cohort 3	
	PC	Control	PC	Control	PC	Control
Pretest $\bar{x}$	2.70	2.77	2.87	2.87	2.82	2.90
Pretest SD	1.04	1.00	1.00	.98	.95	1.00
Posttest $\bar{x}$	2.78	2.74	2.95	2.77	2.86	2.77
Posttest SD	.98	1.00	.97	.88	1.05	.97
$\bar{x}$ Difference	.08	-.03	.08	-.10	.04	-.13
Sign. Difference	NS	NS	NS	.05	NS	.03
Percentage Change	3%	-1%	3%	-3%	1%	-4%
Effect Size	.07	-.03	.06	-.08	.03	-.10
Improvement Index	+3	-1	+2	-3	+1	-4
Pre/Post Correlation	.34	.39	.23	.28	.16	.13
Sign. Correlation	.00	.00	.00	.00	.00	.01
n	304	342	339	423	496	360

High school students' average trust in media was lower than that of middle school students. However, high school students' media trust increased from pretest to posttest for both the PC and control groups. (See Table 32.) The difference in mean pretest/posttest scores for the PC group was .15 in cohort 1, .13 in cohort 2, and .18 in cohort 3. The percentage change was 6%, 5%, and 8%, respectively. The effect sizes (Hedge's *g*) were .14, .12, and .15 corresponding to improvement index scores of +6, +5, and +6 percentile points. The control group high school students' mean scores improved by .13, .24, and .13 across cohorts. The percentage change was 5%, 9%, and 5%. The effect sizes were .10, .22, and .11 with improvement index scores of +4, +8, and +4 percentile points. There were no significant differences in adjusted posttest mean scores on media trust based on the ANCOVA analysis. (See Appendix B, Table B16.)

**Table 32**  
**High School Students' Media Trust by Condition**  
**Difference of Means**

	Cohort 1		Cohort 2		Cohort 3	
	PC	Control	PC	Control	PC	Control
Pretest $\bar{x}$	2.64	2.55	2.73	2.63	2.72	2.60
Pretest SD	.99	1.15	.97	.89	.99	.97
Posttest $\bar{x}$	2.79	2.68	2.86	2.87	2.94	2.73
Posttest SD	.95	1.11	.94	.95	1.10	.98
$\bar{x}$ Difference	.15	.13	.13	.24	.18	.13
Sign. Difference	.00	.04	.00	.00	.00	.00
Percentage Change	6%	5%	5%	9%	8%	5%
Effect Size	.14	.10	.12	.22	.15	.11
Improvement Index	+6	+4	+5	+8	+6	+4
Pre/Post Correlation	.40	.41	.42	.27	.33	.36
Sign. Correlation	.00	.00	.00	.00	.00	.00
n	634	289	434	319	529	360

## CIVIC SKILLS

Civic skills are comprised of a range of proficiencies required for democratic engagement. They encompass behaviors beneficial to the development of personal agency that promotes civic engagement (Winthrop, 2020). Most conceptualizations consider skills that involve communication, collaboration, critique, and decision-making to be important for civic engagement (Ata, 2019). The development of civic skills is essential for critical thinking that facilitates collective action (Civic Mission of Schools, 2011). Patrick (2002) proposed that civic skills are comprised of cognitive skills and participatory skills. Cognitive skills involve describing, synthesizing, and evaluating information pertinent to civic life. They include the ability to monitor the media, gather information, and critically evaluate issues and policies. Participatory skills are associated with following public events and issues as well as taking action to improve conditions in the communities. They consist of voting, listening to and processing diverse views on issues, speaking openly, expressing opinions, working collaboratively to solve problems, and advocating on behalf of a cause. Other perspectives incorporate the notions of cognitive and participatory skills while highlighting the need for critical reasoning skills that facilitate democratic decision-making. These views emphasize the need for citizens to develop negotiating and coalition building skills that can enable reaching consensus to affect positive change. Critical reasoning also involves making moral judgements when taking social action (Patrick, 2003; Kirlin, 2005). Civic skills are bolstered when students develop research, inquiry, communication, and leadership capabilities (Brammer, et al., 2011).

## Teacher Instructional Objectives: Developing Civic Skills

Quality civic education can provide students with deep educational experiences that enable them to understand their rights and responsibilities and develop skills necessary to engage effectively in political and civic life (Branson, 1998; Branson and Quigley, 1998). Schools can help students see how they can engage and what the practice of democracy looks like (Hansen, et al., 2018). However, civic skills are not routinely conveyed through the standard civics curriculum. The PC PD program provided teachers with pedagogical practices and resources to help students develop civic skills.

### Measurement

A survey item measured how much emphasis teachers placed on developing students' civic skills. The response categories were 1 not much, 2 some, and 3 a great deal.

### Analysis

Teachers were more likely to emphasize civic skills as an instructional objective after participating in PC. (See Table 33.) In cohort 1, the percentage of PC teachers who stressed developing civic skills a great deal increased from 40% on the pretest to 73% on the posttest. The pretest/posttest change was from 57% to 71% in cohort 2 and from 22% to 47% in cohort 3. The percentage of control teachers who emphasized civic skills a great deal either declined or remained constant over the course of the study. The percentage accentuating civic skills a great deal was 59% on the pretest and 48% on the posttest in cohort 1, 56% on the pretest and 33% on the posttest in cohort 2, and 24% on the pretest and 25% on the posttest in cohort 3.

**Table 33**  
**Teachers' Emphasis on Civic Skills**

Project Citizen Teachers						
Developing civic skills	Cohort 1		Cohort 2		Cohort 3	
	Pretest	Posttest	Pretest	Posttest	Pretest	Posttest
A Great Deal	40%	73%	57%	71%	22%	47%
Some	49%	27%	43%	29%	50%	42%
Not Much	11%	--	--	--	28%	11%
n	36	36	34	34	39	39

Control Group Teachers						
Developing civic skills	Cohort 1		Cohort 2		Cohort 3	
	Pretest	Posttest	Pretest	Posttest	Pretest	Posttest
A Great Deal	59%	48%	56%	33%	24%	25%
Some	37%	35%	37%	59%	44%	54%
Not Much	4%	17%	7%	7%	32%	21%
n	27	27	27	27	33	33

Difference of means tests indicated that teachers began with scores near the middle of the scale on the measure of developing civic skills in cohorts 1 and 2, and toward to low end of the scale in cohort 3. (See Table 34.) The improvement in the mean scores for the PC teachers was statistically significant in cohorts 1 and 3. The pretest/posttest mean difference was .31, representing a 12% increase in cohort 1. The moderate effect size (Hedge’s *g*) of .42 corresponded to an improvement index score of +16 percentile points. In cohort 3, the difference of pretest/posttest means was .27, a 13% increase. The effect size was .30 and the improvement index was +12 percentile points. There was no significant difference for PC teachers in cohort 2. The pretest/posttest difference of means for the control group was negative in cohort 1, with a difference of mean of -.30, a percentage change of -12%, and effect size of -.42, and an improvement index of -16 percentile points. The trend was similar in cohort 2, with a difference of means of -.31, a percentage change of -12%, an effect size of -.54, and an improvement index of -20 percentile points. The slight decrease in means from pretest to posttest was nonsignificant in cohort 3 for control teachers.

**Table 34**  
**Developing Civic Skills by Condition**  
**Difference of Means**

Developing civic skills	Cohort 1		Cohort 2		Cohort 3	
	PD	Control	PD	Control	PD	Control
Pretest $\bar{x}$	2.36	2.61	2.58	2.59	2.08	2.03
Pretest SD	.65	.49	.50	.59	.75	.74
Posttest $\bar{x}$	2.67	2.30	2.68	2.27	2.35	1.96
Posttest SD	.47	.76	.54	.63	.67	.69
$\bar{x}$ Difference	.31	-.30	.10	-.31	.27	-.07
Sign. Difference	.00	.03	NS	.00	.03	NS
Percentage Change	12%	-12%	4%	-12%	13%	-3%
Effect Size	.42	-.42	.16	-.54	.30	-.08
Improvement Index	+16	-16	+6	-20	+12	-3
Pre/Post Correlation	.10	.77	.31	.57	.27	.36
Sign. Correlation	NS	.00	.05	.00	.05	.03
n	36	27	34	27	39	33

### **PBL Pedagogies for Developing Civic Skills**

The PC PD program provided teachers with pedagogic tools that are used in project-based learning and are conducive to conveying civic skills to students. These pedagogies are generally applicable to civics instruction. They also are central to successfully implementing the PC curriculum. Teachers actively engaged students in identifying a problem in their community or school, researching the problem, working with their classmates to come up with alternative solutions and develop an action plan, and engaging with community leaders and stakeholders. These activities are beneficial to students’ development of civics-related SEL competencies, such as collaboration, cooperation, problem-solving, and communication skills.

Teachers who participated in PC were more likely to employ project-based pedagogies in their classrooms after participating in the PD program than the control group. Teachers' comments underscored the efficacy of prioritizing pedagogies that nurture students' civic disposition and readiness for active participation in the democratic process. One PC teacher reflected on the experience: "The biggest gain for my students was the realization that they could actually change/influence public policy. As a social studies teacher, this impressed me the most. We talk and teach everyday about how our government works, but the concept of participatory government didn't truly register until we did PC." Another teacher shared: "My students loved Project Citizen! They felt very empowered to be able to choose their own policy to address. They enjoyed brainstorming possible solutions and liked that they could actually propose their solutions to the appropriate policymakers. The group that successfully convinced the city council to install a flashing crosswalk beacon in front of the school was especially proud that they were able to actually bring about a policy change."

### Measurement

PC and control group teachers were asked on the pretest surveys to indicate how much emphasis (1 not much, 2 some, 3 a great deal) they placed on ten learning approaches in their civics classes. On the posttest, they were asked questions relating to the class—Project Citizen or a traditional civics class—that they taught during the research project. These items assessed how much emphasis teachers placed on: 1) identifying issues and problems facing their community, 2) working cooperatively with others to solve a problem in their community, 3) learning about the public policy process, 4) researching a problem, 5) developing a plan of action for addressing a problem, 6) evaluating alternative solutions to a problem, 7) directly engaging in the community, 8) developing civic skills, 9) developing dispositions to become involved in community affairs, and 10) having students reflect on their learning experience. Additive indexes of project-based learning pedagogies were created consisting of all ten items for each cohort. The indexes ranged from 1 to 21 and met WWC standards for reliability with Cronbach's  $\alpha$  scores of .86 and above. (See Table 35.)

**Table 35**  
**Project-Based Pedagogies Index Range and Reliability**

	<b>Index Range</b>	<b>Pretest Cronbach's <math>\alpha</math></b>	<b>Posttest Cronbach's <math>\alpha</math></b>
<b>Cohort 1</b>	1-21	.91	.91
<b>Cohort 2</b>	1-21	.86	.94
<b>Cohort 3</b>	1-21	.90	.94

### Analysis

Teachers were asked to reflect on their use of project-based pedagogies at the outset of the study and to evaluate their experience after completing the class in the current academic year. The emphasis the intervention group teachers placed on activities that were relevant to PC in their classrooms increased markedly from pretest to posttest for all three cohorts. (See Table 36.) The PC teachers' mean scores on the PBL pedagogies index increased by 32% in cohort 1, 30% in cohort 2, and 27% in cohort 3. All of the mean differences were statistically significant at

$p \leq .01$ . The effect sizes (Hedge's  $g$ ) for the PC teachers across the three cohorts were .77, .75, and .45. These coefficients correspond to improvement index scores of +28, +27, and +17 percentile points. In contrast, the mean scores of the control group decreased from pretest to posttest. The pretest/posttest differences were statistically significant for cohorts 1 and 2, but not for cohort 3. The percentage change in pretest/posttest mean scores was -19% for cohort 1, -20% for cohort 2, and -10% for cohort 3. The effect sizes were -.57, -.51, and -.18, which corresponded to improvement index scores of -22, -20, and -7 percentile points.

**Table 36**  
**Project-Based Pedagogies Index by Condition**  
**Difference of Means**

Policy Index	Cohort 1		Cohort 2		Cohort 3	
	PC	Control	PC	Control	PC	Control
Pretest $\bar{x}$	12.23	13.68	12.65	11.67	11.56	11.07
Pretest SD	4.77	5.43	4.45	4.73	5.44	1.19
Posttest $\bar{x}$	16.18	11.36	16.48	9.28	14.63	9.89
Posttest SD	3.91	5.65	4.27	5.38	5.38	4.55
$\bar{x}$ Difference	3.94	-2.32	3.83	-2.38	3.06	-1.18
Sign. Difference	.00	.01	.00	.01	.00	NS
Percentage Change	32%	-17%	30%	-20%	27%	-11%
Effect Size	.77	-.57	.75	-.51	.45	.18
Improvement Index	+28	-22	+27	-20	+17	-7
Pre/Post Correlation	.33	.75	.34	.61	.25	.37
Sign. Correlation	.00	.00	.00	.00	.00	.00
n	36	27	34	27	39	33

ANCOVA analyses were performed to calculate the adjusted mean posttest scores on the PBL pedagogies index for the intervention and control groups and the difference of means between the groups. The difference of posttest means between the PC and control groups was statistically significant at  $p \leq .01$  for all three cohorts. The adjusted mean group differences were 5.47 for cohort 1, 6.71 for cohort 2, and 4.69 for cohort 3. The PC group mean was 33% higher than the control group mean in cohort 1, 41% higher in cohort 2, and 32% higher in cohort 3. The effect sizes (Hedge's  $g$ ) across cohorts were 1.15, 1.40, and .92. The corresponding improvement index scores were +37, +42, and +32 percentile points. (See Appendix B, Table B17.)

### Active Pedagogies that Convey Civic Skills

PC teachers successfully implemented active pedagogies related to cooperative, participatory learning into their lessons. Active learning is central to the PC curriculum intervention. PC teachers were much more likely to incorporate activities into their classroom instruction after completing the program during all three cohorts. The scores on an instructional activity index for PC teachers increased significantly from pretest to posttest. The scores of control group teachers either decreased or remained relatively constant.



PC teachers highlighted the instructional activities’ connections to public policy and local government. One teacher recalled, “Project Citizen was a great way for my students to learn more about public policy and the way it impacts our lives. Many students started the project knowing very little beyond the three branches of government at the federal level, but as they researched and learned, they had the chance to learn who their representatives are. Some reached out and interviewed our elected state congressperson, and another spoke with our mayor.”

**Measurement**

The successful implementation of the PC curriculum requires that students perform activities related to their cooperative, project-based learning experience. Teachers in the study were asked if they had students in their classes: 1) create a portfolio of their work, 2) present an action plan for dealing with a community problem to their class or school, 3) present an action plan for dealing with a problem to community leaders, 4) contact public officials about a community problem, 5) attend a community meeting, 6) post information about a community problem to social media or a blog, and 7) work actively in their school or community to help solve a problem. Three additional items were included in the cohort 3 study: 8) identify a problem in their school or community and 9) research a problem in their school or community, and 10) use STEM skills when addressing a problem in their school or community. Each of these items was measured as a dichotomy scored 1 if they did the activity and 0 if they did not. For the pretest, PC and control teachers were asked if they had their students do any of these activities in their classes in the past two years. The posttest asked if they had done these things in their class during the current semester. The seven items asked in each cohort were combined to form an additive index of PC instructional activities that ranged from 0 to 7. The index reliability (Cronbach’s  $\alpha$ ) was acceptable. (See Table 37.)

**Table 37**  
**Active Pedagogies Index Range and Reliability**

	<b>Index Range</b>	<b>Pretest Cronbach’s <math>\alpha</math></b>	<b>Posttest Cronbach’s <math>\alpha</math></b>
<b>Cohort 1</b>	0-7	.73	.76
<b>Cohort 2</b>	0-7	.77	.88
<b>Cohort 3</b>	0-7	.78	.81

**Analysis**

The percentage of PC teachers who implemented the PC instructional activities increased substantially in the semester in which the curriculum was taught compared to prior practices. (See Table 38.) The percentage of PC teachers who used each of the active pedagogies increased significantly from pretest to posttest every study year. For example, the percentage of PC teachers who had their students create a portfolio of their work increased from 25% pre-program to 72% in cohort 1, from 36% to 84% in cohort 2, and from 38% to 84% in cohort 2. These findings indicate a high level of compliance among PC teachers in implementing core elements of the curriculum. Approximately 90% of PC teachers in each cohort had their students present an action plan for dealing with a problem to their class or school. Over 90% of PC teachers in

cohort 3 had their students identify and research a problem. Seventy percent or more had their students create a portfolio, contact public officials about a community problem, and work actively in their school or community to solve a problem. The percentage of teachers whose students presented an action plan to community leaders increased from 53% in cohort 1 to 74% in cohort 2, and 68% in cohort 3. Over half of cohort 3 PC teachers had their students use STEM skills when addressing a problem in their school or community, up from 28% on the pretest. A smaller percentage of teachers had their students attend a meeting or post information about a community problem to social media or a blog. However, the number increased from pretest to posttest except for attending a meeting in cohort 3.

**Table 38**  
**Taught Using Active Pedagogies**  
**PC Intervention Group**

Active Pedagogies	Cohort 1		Cohort 2		Cohort 3	
	Pretest	Posttest	Pretest	Posttest	Pretest	Posttest
Create Portfolio	25%	72% <sup>a</sup>	36%	84% <sup>a</sup>	38%	84% <sup>a</sup>
Action Plan/School	34%	93% <sup>a</sup>	33%	87% <sup>a</sup>	46%	89% <sup>a</sup>
Action Plan/Leaders	11%	53% <sup>a</sup>	15%	74% <sup>a</sup>	28%	68% <sup>a</sup>
Contact Officials	27%	77% <sup>a</sup>	33%	81% <sup>a</sup>	23%	51% <sup>a</sup>
Attend Meeting	11%	23%	24%	42% <sup>a</sup>	23%	11% <sup>a</sup>
Post Information	9%	23%	3%	26% <sup>a</sup>	13%	22% <sup>a</sup>
Solve Problem	43%	72% <sup>a</sup>	54%	87% <sup>a</sup>	38%	78% <sup>a</sup>
Identify Problem	--	--	--	--	77%	95% <sup>a</sup>
Research Problem	--	--	--	--	69%	92% <sup>a</sup>
STEM Skills	--	--	--	--	28%	54% <sup>a</sup>
n	36	27	34	32	36	33

<sup>a</sup>Statistically significant pretest/posttest difference based on comparative error

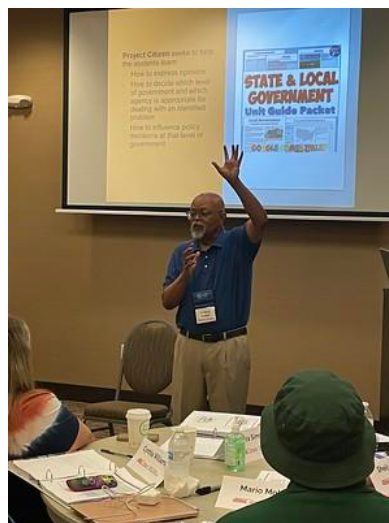
The pretest/posttest analysis of the control group yielded no consistent pattern for the implementation of PC instructional activities. (See Table 39.) The percentages increased or decreased modestly or remained the same over time. Apart from posting information in cohort 3, the percentage of control group teachers who reported using the activity with their students in the semester of the posttest was notably smaller than for the PC group. For most of the posttest indicators, one-quarter or less of the control group teachers used the activity. Identifying a problem, working to solve a problem, and researching a problem in cohort 3 were the only instances where at least 60% of control group teachers implemented the activity during the current academic year. Fifty percent or more of the control teachers had their students create a portfolio in cohort 1 and cohort 3.

**Table 39**  
**Taught Project Citizen Instructional Activities**  
**Control Group**

PC Activities Control Group	Cohort 1		Cohort 2		Cohort 3	
	Pretest	Posttest	Pretest	Posttest	Pretest	Posttest
Create Portfolio	31%	52%	37%	33%	43%	55%
Action Plan/School	29%	28%	22%	7%	43%	41%
Action Plan/Leaders	28%	9%	15%	11%	23%	10%
Contact Officials	28%	23%	33%	26%	11%	7%
Attend Meeting	14%	5%	22%	7%	6%	7%
Post Information	14%	14%	8%	4%	11%	38% <sup>a</sup>
Solve Problem	57%	33%	41%	15% <sup>1</sup>	31%	69% <sup>a</sup>
Identify Problem	--	--	--	--	54%	62%
Research Problem	--	--	--	--	46%	62%
n	36	27	34	32	36	33

<sup>a</sup> Statistically significant pretest/posttest difference based on comparative error

Difference of means tests revealed that teachers were far more inclined to incorporate activities into their classroom instruction after participating in the PC professional development program. (See Table 40.) The mean scores of PC teachers on the instructional activities index increased significantly from pretest to posttest in all three cohorts. The percentage change across cohorts was 156%, 136%, and 99% respectively. The effect sizes of 1.31 for cohort 1, 1.29 for cohort 2, and .77 for cohort 3 were all large. The effect sizes were converted to improvement index scores of +39, +40, and +27 percentile points. In contrast, the control teachers' scores on the PC activities index decreased from pretest to posttest. The change was statistically significant only for cohort 2. The pretest/posttest percentage change in mean scores was -20%, -34%, and -21% across cohorts. The negative effect sizes were moderate in cohort 1 (-.25), small in cohort 3 (-.16), and moderate in cohort 2 (-.56). The improvement index scores were -9, -21, and -6 percentile points.



**Table 40**  
**Active Pedagogies Index by Condition**  
**Difference of Means**

PC Activities Index	Cohort 1		Cohort 2		Cohort 3	
	PC	Control	PC	Control	PC	Control
Pretest $\bar{x}$	1.54	2.09	2.03	1.80	2.05	2.00
Pretest SD	1.39	2.11	1.69	1.93	2.02	1.85
Posttest $\bar{x}$	4.17	1.67	4.80	1.19	4.08	1.58
Posttest SD	1.66	1.78	1.84	1.74	1.67	1.74
$\bar{x}$ Difference	2.62	-.42	2.77	-.62	2.02	-.41
Sign. Difference	.00	NS	.00	.01	.00	NS
Percentage Change	156%	-20%	136%	-34%	99%	-21%
Effect Size	1.31	-.25	1.29	-.56	.77	-.16
Improvement Index	+39	-9	+40	-21	+27	-6
Pre/Post Correlation	.16	.68	.30	.84	.15	.79
Sign. Correlation	NS	.00	.05	.00	NS	.00
n	36	27	34	32	39	33

An ANCOVA model estimated the adjusted mean differences in posttest scores between the PC and control groups on the active pedagogies index. The mean differences across cohorts were large. The percentage differences between the PC and control group posttest means were 63%, 73%, and 59%, respectively. The effect sizes (Hedge’s *g*) were 1.57, 1.94, and 1.39. The corresponding improvement index scores were +44, +47, and +42 percentile points. (See Appendix B, Table B18.)

### Students’ Civic Skills

The study examined the extent to which students felt prepared to engage in civic life based on their perceptions of their civic skills. Middle school students who participated in PC felt that their civic skills increased significantly across all three cohorts. There was no change in the control group students’ belief that they had the skills to engage. High school students in both the PC and control groups became more confident about their ability to engage. The PC group students’ positive view of their civic skills increased more than that of the control group students. A middle school student reported, “Project citizen was a good experience, I got to learn more about my community and wrote to government officials.”

### Measurement

Students’ perception of their civic skills was measured by combining their scores on three items. Students were asked how much they agreed with the following statements: 1) I have a pretty good understanding of the important political issues facing our country, 2) I can help organize people to solve a problem in my community, and 3) I can find the government official or branch of government that is responsible for solving a problem in my community. The

respondents could 1 strongly disagree, 2 disagree, 3 neither agree nor disagree, 4 agree, and 5 strongly agree. The three items were combined to form an additive index that ranged from 1 (low perceived civic skills) to 13 (high perceived civic skills). The civic skills index reliability was acceptable across all three cohorts. (See Table 41.)

**Table 41**  
**Civic Skills Index**  
**Range and Reliability**

	<b>Middle School</b>		
	<b>Index Range</b>	<b>Pretest Cronbach's <math>\alpha</math></b>	<b>Posttest Cronbach's <math>\alpha</math></b>
<b>Cohort 1</b>	1-13	.75	.75
<b>Cohort 2</b>	1-13	.77	.74
<b>Cohort 3</b>	1-13	.74	.76
	<b>High School</b>		
	<b>Index Range</b>	<b>Pretest Cronbach's <math>\alpha</math></b>	<b>Posttest Cronbach's <math>\alpha</math></b>
<b>Cohort 1</b>	1-13	.79	.79
<b>Cohort 2</b>	1-13	.75	.80
<b>Cohort 3</b>	1-13	.68	.75



## Analysis

Middle school students who had taken PC had more positive perceptions of their civic skills after they received the curriculum. (See Table 42.) The pretest/posttest mean differences of .58, .93, and .46 were statistically significant ( $p \leq .01$ ) across all three cohorts. The percentage change was 8% for cohort 1, 13% for cohort 2, and 6% for cohort 3. The effect sizes (Hedge's  $g$ ) were small to medium at .24, .33, and .15. The improvement index scores were +6, +13, and +6 percentile points, respectively. In contrast, the differences in the mean pretest/posttest scores of the control group students were small and nonsignificant.

**Table 42**  
**Middle School Students' Civic Skills by Condition**  
**Difference of Means**

	Cohort 1		Cohort 2		Cohort 3	
	PC	Control	PC	Control	PC	Control
Pretest $\bar{x}$	7.70	7.64	7.23	7.94	7.33	7.11
Pretest SD	2.39	2.56	2.63	2.68	2.50	2.54
Posttest $\bar{x}$	8.28	7.79	8.16	8.07	7.79	7.15
Posttest SD	2.51	2.59	2.36	2.48	2.62	2.61
$\bar{x}$ Difference	.58	.15	.93	.12	.46	.04
Sign. Difference	.00	NS	.00	NS	.00	NS
Percentage Change	8%	2%	13%	2%	6%	<1%
Effect Size	.24	.06	.33	.05	.15	.01
Improvement Index	+6	+2	+13	+2	+6	0
Pre/Post Correlation	.52	.50	.39	.47	.33	.23
Sign. Correlation	.00	.00	.00	.00	.00	.00
n	314	351	347	433	504	381

The ANCOVA analysis found that the adjusted mean posttest scores for middle school students who took part in PC were significantly higher on the civic skills index than those of the control group students in cohorts 1 and 2. The percentage difference was 5% for both cohorts. The effect sizes were small, .16 for cohort 1 and .19 for cohort 2, with improvement index scores of +6 and +8 percentile points. The difference in adjusted mean posttest scores between the PC and control groups was nonsignificant in cohort 3. (See Appendix B, Table B19.)

High school students' perceptions of their ability to engage competently in civic life improved significantly after participating in PC across all three cohorts. (See Table 43.) The difference in pretest/posttest means was .59, .80, and .71. The percentage change was 7% for cohort 1, 10% for cohort 2, and 9% for cohort 3. The effect sizes (Hedge's  $g$ ) were small to moderate at .25, .33, and .38, respectively. The associated improvement index scores were +6, +13, and +15 percentile points. The perceived civic skills scores of high school students in the control group increased significantly in cohorts 2 and 3, but not in cohort 1. The pretest/posttest mean differences were notably smaller than for the PC group students, as were the percentage change, effect size, and improvement index scores.

**Table 43**  
**High School Students' Civic Skills by Condition**  
**Difference of Means**

	Cohort 1		Cohort 2		Cohort 3	
	PC	Control	PC	Control	PC	Control
Pretest $\bar{x}$	8.29	8.31	7.87	7.78	7.56	7.82
Pretest SD	2.41	2.77	2.48	2.55	2.18	2.28
Posttest $\bar{x}$	8.89	8.43	8.67	8.27	8.26	8.36
Posttest SD	2.36	2.75	2.36	2.56	2.334	2.35
$\bar{x}$ Difference	.59	.12	.80	.48	.71	.53
Sign. Difference	.00	NS	.00	.00	.00	.00
Percentage Change	7%	1%	10%	6%	9%	7%
Effect Size	.25	.04	.33	.19	.38	.20
Improvement Index	+6	+1	+13	+7	+15	+8
Pre/Post Correlation	.56	.50	.48	.47	.33	.36
Sign. Correlation	.00	.00	.00	.00	.00	.00
n	642	293	440	323	533	347

The ANCOVA analysis found that the difference in adjusted posttest means was significantly higher for the PC group than the control group in cohorts 1 and 2, but not in cohort 3. The mean difference was .46 for cohort 1 and .53 for cohort 2. These differences were small, with percentage differences of 5% and 6%, effect sizes (Hedge's *g*) of .19 and .22, and improvement index scores of +8 and +9 percentile points. (See Appendix B, Table B20.)

## CIVIC ENGAGEMENT

Civic engagement encompasses a wide range of activities, political and non-political, that promote the public good and are intended to improve the quality of life in communities and society (Carney, et al., 2023). It can be defined as voluntary involvement in community affairs that is put forth in the public interest. It is active participation that involves community service that is collaborative and works toward addressing areas of local, national, and global concern.<sup>4</sup> Civic engagement is the culmination of the development of the knowledge, skills, dispositions, norms, and actions necessary for achieving these goals. People who are civically engaged feel it is their responsibility to address the problems of the larger society and promote a positive quality of life in their communities (Ehrlich, 2000). An engaged citizen has the ability, agency, and opportunity to address issues of community concern by acting through a variety of channels (Delli Carpini, 2000). The boundaries of civic engagement in the current political and media environment have been widening. Traditional forms of civic engagement include voting and participation in the electoral process, engaging in discussion and debate, participating in community affairs, volunteering, advocacy, and protesting. Digital media have created new

<sup>4</sup> Definition developed by the Media and Civic Engagement class, Georgetown University, spring semester 2024.

spaces for these traditional forms of engagement and have facilitated novel opportunities for expression, investigation, dialogue, voice, and action (Bowen, Gordon, and Chojnacki, 2017).

PC teachers' perceptions of their efficacy to encourage students to feel prepared to participate in political and public life increased notably after their participation in the PD program. Commensurate with this finding, PC middle and high school students' understanding of the important political issues facing the country increased. They were better able to identify the government official or branch of government responsible for solving community problems. The findings were stronger for high school students than middle schoolers.

## **Teacher Efficacy in Getting Students to Engage**

Getting students to engage in community affairs is not often a top priority in traditional civics, social studies, and American government classes. The PC PD program and curriculum intervention are designed to provide teachers with pedagogies and resources that encourage students to take part positively and effectively in community affairs. PC teachers became significantly more confident in their ability to get students to engage in their community because of the program.

### **Measurement**

Teachers were asked how effective they were in getting students to engage civically. Survey items measured how much teachers felt they could encourage electoral participation and community involvement. The response categories were 1 not much, 2 some, and 3 a great deal.

### **Analysis**

PC teachers were more confident of their ability to get students to participate in elections and their community after participating in the PCRCP and implementing the curriculum in their classrooms. (See Table 44.) The percentage of teachers indicating that they had a great deal of efficacy in encouraging electoral participation increased from 51% on the pretest to 70% on the posttest in cohort 1, from 55% to 71% in cohort 2, and from 47% to 54% in cohort 3. The percentage change in cohort 3 of 7 percentage points—after two years of the pandemic—was notably smaller than for cohort 1 (19 percentage points) and cohort 2 (16 percentage points). In contrast, the percentage of control group teachers who felt they were effective in encouraging electoral participation remained fairly constant (cohorts 1 and 3) or declined (cohort 2).

The percentage of PC teachers who felt effective in encouraging their students to become involved in their community increased in all three cohorts. The gains were greatest in cohort 1 (20 percentage points) and were smaller in cohort 2 (8 percentage points) and cohort 3 (13 percentage points). In cohort 1, the percentage of control teachers who felt they were greatly effective in encouraging community involvement on the pretest was anomalously low at 26% and climbed to 43% on the posttest. The percentage of control group teachers who felt they could encourage their students to engage dropped from 50% to 33%. There was a similar precipitous decrease in control teacher efficacy in cohort 3 from 37% to 17%.



**Table 44**  
**Civic Engagement Efficacy**  
**Percentage of Teachers Responding “A Great Deal”**

<b>Project Citizen Teachers</b>						
	<b>Cohort 1</b>		<b>Cohort 2</b>		<b>Cohort 3</b>	
	<b>Pretest</b>	<b>Posttest</b>	<b>Pretest</b>	<b>Posttest</b>	<b>Pretest</b>	<b>Posttest</b>
Encourage electoral participation	51%	70%	55%	71%	47%	54%
Encourage community involvement	45%	65%	63%	71%	42%	55%

<b>Control Group Teachers</b>						
	<b>Cohort 1</b>		<b>Cohort 2</b>		<b>Cohort 3</b>	
	<b>Pretest</b>	<b>Posttest</b>	<b>Pretest</b>	<b>Posttest</b>	<b>Pretest</b>	<b>Posttest</b>
Encourage electoral participation	44%	47%	52%	44%	49%	48%
Encourage community involvement	26%	43%	59%	33%	37%	17%

### **Students’ Propensity for Engagement**

Students’ inclination to engage civically increased during their PC experience. They were more likely to indicate that they would turn out to vote in elections in the future. They also felt more ready to engage in public life after completing the program. The findings were most evident for PC high school students. High school students in the control group’s propensity for engagement increased over the course of the study, but not as much as for the PC students.

### **Measurement**

Students were asked about their likelihood of voting if they had the opportunity. They responded to the item: If you were able to vote in elections, how likely is it that you would turn out to vote? The response categories were 1 unlikely, 2 somewhat likely, and 3 very likely. Students reported on how equipped they felt to be civically engaged. They recorded their agreement with the statement: I am well-prepared to participate in political and public life. The response categories were 1 strongly disagree, 2 disagree, 3 neither agree nor disagree, 4 agree, and 5 strongly agree.

### **Analysis**

The likelihood of middle school students who participated in PC voting if they had the opportunity increased from pretest to posttest in each cohort. (See Table 45.) The percentage of PC middle schoolers who would very likely turn out increased from 56% to 63% in cohort 1, 50% to 53% in cohort2, and 44% to 52% in cohort 3. The pattern was mixed for middle school students in the control group. In cohort 1, the percentage of control group students stating that

they were very likely to vote increased from 53% to 59%. However, the percentage declined from pretest to posttest in subsequent cohorts.

**Table 45**  
**Middle School Students' Likelihood of Voting**

Middle School Project Citizen Students						
Likelihood of Voting	Cohort 1		Cohort 2		Cohort 3	
	Pretest	Posttest	Pretest	Posttest	Pretest	Posttest
Very Likely	56%	63%	50%	53%	44%	52%
Somewhat Likely	33%	27%	32%	42%	36%	38%
Unlikely	11%	10%	18%	5%	20%	10%
n	314	314	347	347	504	504

Middle School Control Group Students						
Likelihood of Voting	Cohort 1		Cohort 2		Cohort 3	
	Pretest	Posttest	Pretest	Posttest	Pretest	Posttest
Very Likely	53%	59%	51%	47%	46%	41%
Somewhat Likely	29%	24%	33%	39%	35%	42%
Unlikely	18%	17%	16%	14%	19%	17%
n	351	351	433	433	381	381



As would be expected given their proximity to voting age, high school students expressed a greater probability of voting than middle schoolers. The likelihood of high school students enrolled in PC voting if they had the opportunity increased after they completed the curriculum for every cohort. (See Table 46.) The percentage of PC students who responded that they were very likely to vote was high at over 60% from the outset. The percentage changed from 69% to 72% in cohort 1, 63% to 69% in cohort 2, and 66% to 76% in cohort 3. The prospect of control group students being very likely to turn out increased in cohort 1 (from 53% to 59%) and cohort 3 (from 64% to 69%) but declined in cohort 2 (from 61% to 53%).

**Table 46**  
**High School Students' Likelihood of Voting**

High School Project Citizen Students						
Likelihood of Voting	Cohort 1		Cohort 2		Cohort 3	
	Pretest	Posttest	Pretest	Posttest	Pretest	Posttest
Very Likely	69%	72%	63%	69%	66%	76%
Somewhat Likely	32%	21%	24%	24%	22%	20%
Unlikely	13%	7%	13%	7%	12%	4%
n	642	642	439	439	533	533

High School Control Group Students						
Likelihood of Voting	Cohort 1		Cohort 2		Cohort 3	
	Pretest	Posttest	Pretest	Posttest	Pretest	Posttest
Very Likely	53%	59%	61%	53%	64%	69%
Somewhat Likely	29%	24%	28%	36%	18%	22%
Unlikely	18%	17%	12%	11%	18%	9%
n	293	293	323	323	347	347

Middle school students' belief that they were prepared for engagement in political and public life increased after experiencing the PC curriculum. (See Table 47.) The percentage of PC middle school students who agreed that they were prepared to engage increased from 37% to 41% in cohort 1, from 30% to 39% in cohort 2, and from 40% to 46% in cohort 3.



**Table 47**  
**Middle School Students' Preparation for Engagement**

Middle School Project Citizen Students						
	Cohort 1		Cohort 2		Cohort 3	
	Pretest	Posttest	Pretest	Posttest	Pretest	Posttest
Agree	37%	41%	30%	39%	40%	46%
Neither	40%	39%	41%	41%	40%	36%
Disagree	23%	20%	29%	20%	20%	18%
n	314	314	347	347	504	504

Middle School Control Group Students						
	Cohort 1		Cohort 2		Cohort 3	
	Pretest	Posttest	Pretest	Posttest	Pretest	Posttest
Agree	38%	38%	39%	36%	39%	37%
Neither	35%	35%	41%	44%	40%	41%
Disagree	27%	27%	20%	20%	21%	22%
n	351	351	433	433	381	381

Difference of means tests were performed on the preparation for engagement item using the five-point scale. The pretest/posttest mean differences on this item for middle school students were small and nonsignificant with one exception. (See Table 48.) In cohort 2, the mean for the PC students increased significantly, with a pretest/posttest difference of .27 that was statistically significant at  $p \leq .01$ . The percentage change was 9%, the effect size (Hedge's  $g$ ) was .22, and the improvement index was +9 percentile points.

**Table 48**  
**Middle School Students' Preparation for Engagement by Condition**  
**Difference of Means**

	Cohort 1		Cohort 2		Cohort 3	
	PC	Control	PC	Control	PC	Control
Pretest $\bar{\chi}$	3.19	3.17	2.95	3.23	3.20	3.17
Pretest SD	1.06	1.08	1.06	1.08	1.04	1.03
Posttest $\bar{\chi}$	3.28	3.13	3.22	3.23	3.28	3.16
Posttest SD	1.03	1.09	.98	.97	1.03	1.02
$\bar{\chi}$ Difference	.08	-.03	.27	.00	.08	-.01
Sign. Difference	NS	NS	.00	NS	NS	NS
Percentage Change	3%	-1%	9%	0	3%	0
Effect Size	.07	.02	.22	.00	.06	.01
Improvement Index	+3	+1	+9	0	+2	0
Pre/Post Correlation	.42	.38	.29	.48	.30	.28
Sign. Correlation	.00	.00	.00	.00	.00	.00
n	314	351	347	433	504	381

PC high school students felt more prepared to engage in politics and public life after taking part in the program. (See Table 49.) Half or more of the PC students indicated that they were prepared to engage on the posttest. The percentage of PC students who agreed that they were prepared to engage increased from 45% to 54% in cohort 1, from 36% to 50% in cohort 2, and from 44% to 51% in cohort 3. The number of PC high schoolers who did not feel prepared dropped in each cohort. The percentage of control group students who indicated that they were ready to engage increased from 38% to 44% in cohort 2 and from 42% to 49% in cohort 3. There was no change in cohort 1.

**Table 49**  
**High School Students' Preparation for Engagement**

<b>High School Project Citizen Students</b>						
	<b>Cohort 1</b>		<b>Cohort 2</b>		<b>Cohort 3</b>	
	<b>Pretest</b>	<b>Posttest</b>	<b>Pretest</b>	<b>Posttest</b>	<b>Pretest</b>	<b>Posttest</b>
Agree	45%	54%	36%	50%	44%	51%
Neither	35%	34%	42%	37%	38%	34%
Disagree	20%	12%	22%	13%	18%	15%
n	642	642	439	439	533	533

<b>High School Control Group Students</b>						
	<b>Cohort 1</b>		<b>Cohort 2</b>		<b>Cohort 3</b>	
	<b>Pretest</b>	<b>Posttest</b>	<b>Pretest</b>	<b>Posttest</b>	<b>Pretest</b>	<b>Posttest</b>
Agree	47%	48%	38%	44%	42%	49%
Neither	30%	35%	39%	38%	37%	37%
Disagree	23%	17%	23%	18%	21%	14%
n	293	293	323	323	347	347

The analysis of mean differences for the high school students demonstrated that average scores on the preparation for engagement item increased for both PC and control group students. (See Table 50.) The trend was more pronounced and consistent for the PC high schoolers than the control group. The pretest/posttest mean differences were statistically significant for the PC high school students in all three cohorts. In cohort 1, the mean difference was .23, the percentage change was 7%, the effect size was .22, and the improvement index was +9 percentile points. The finding was somewhat stronger in cohort 2, with a mean difference of .31, representing a 10% change. The effect size was .28 corresponding to an improvement index score of +11 percentile points. In cohort 2, the mean difference was .20, the percentage change was 6%, the effect size was .18, and the improvement index was +7 percentile points. The control group students' pretest/posttest values for preparation for engagement were significant for cohorts 2 and 3 only. The mean differences were smaller than for the PC high school students.

**Table 50**  
**High School Students' Preparation for Engagement by Condition**  
**Difference of Means**

	Cohort 1		Cohort 2		Cohort 3	
	PC	Control	PC	Control	PC	Control
Pretest $\bar{x}$	3.34	3.32	3.18	3.17	3.20	3.30
Pretest SD	1.05	1.18	1.01	1.03	.92	.94
Posttest $\bar{x}$	3.57	3.42	3.49	3.34	3.40	3.40
Posttest SD	1.00	1.08	.99	1.03	.93	.94
$\bar{x}$ Difference	.23	.10	.31	.17	.20	.10
Sign. Difference	.00	NS	.00	.00	.00	.03
Percentage Change	7%	3%	10%	5%	6%	3%
Effect Size	.22	.08	.28	.16	.18	.08
Improvement Index	+9	+3	+11	+6	+7	+3
Pre/Post Correlation	.51	.49	.38	.44	.28	.30
Sign. Correlation	.00	.00	.00	.00	.00	.00
n	642	293	440	323	533	347

## CIVICS-RELATED SEL COMPETENCIES

Social and emotional learning is “the process through which all young people and adults acquire and apply the knowledge, skills, and attitudes to develop healthy identities, manage emotions, and achieve personal and collective goals. People with strong SEL competencies feel and show empathy for others, establish and maintain positive relationships, and make responsible and caring decisions (CASEL, n.d.). SEL emphasizes students’ connection to one another and society. It is fundamental to the socialization of young people through the family, school, and community (Rivas-Drake, 2022). SEL competencies are integral to the development of civic dispositions and skills (Ata, 2019; Owen and Irion-Groth, 2020; Owen and Phillips, 2023). “By integrating SEL and civic learning, students have opportunities to develop skills and relationships needed to participate as caring and engaged community members” (CASEL, 2021).

Civic educators can facilitate students’ self-care, self-awareness, social awareness, self-management, and relationship skills (CASEL, 2021). These competencies are central to students’ ability to reflect on issues they care about, gain a sense of their capacity to make a difference, work cooperatively with others to make responsible decisions, and take action. Self-care encompasses the actions students take to improve their physical, mental, and emotional health. Students practice self-care to manage stress, boost their confidence, and maintain healthy relationships with those around them (Center for Responsive Schools, 2021). Self-care is especially relevant as students continue to deal with the effects of the COVID-19 pandemic on their physical wellbeing, sense of isolation, mental health, and academic achievement (Kuhfeld, Soland, Lewis, and Morton, 2022). Self-management involves students’ ability to control and handle their thoughts, emotions, and behaviors. It includes responsible decision-making in school

and personal life, and emphasizes time-management skills, completing tasks, common courtesy, and self-advocacy, like asking for help or clarification (Dees, 2023). Self-awareness, social-awareness, and relationships skills are interrelated SEL constructs. Self-awareness is “the ability to accurately recognize one’s own emotions, thoughts, and values, and how they influence behavior” (CASEL, n.d.). Students should be able to assess their own strengths and limitations and display a realistic sense of confidence and optimism. Self-management reflects students’ capacity to regulate their emotions, thoughts, and behaviors in different situations (CASEL, n.d.). Relationship skills relate to students’ ability to establish and maintain healthy relationships in diverse settings through communication, self-advocacy, demonstrating gratitude and cultural humility, engaging in collaborative problem-solving, resisting negative social pressure, and standing up for the rights of others (CASEL, 2020). Civil discourse—teaching students how to act and react when they disagree with others—is a relationship skill that is central to civic learning. By encouraging and modeling respectful engagement, teachers can help develop students’ skills for participating in respectful communication and disagreement. Critical thinking, communication, and collaboration skills are key civic-related SEL competencies. Students can learn to base their viewpoints on reason and factual evidence rather than making emotional arguments. Instructional techniques to achieve these objectives emphasize multiple perspective-taking, active and empathetic listening, respectful dialogue, and tolerance of diverse groups and ideas.

A high school teacher described how PC helped a student develop SEL competencies.

My students gained a great deal of confidence overall. I had one student who is particularly disengaged in school, and who often presents behavior challenges. He was deeply absorbed in this project and took it on himself to contact experts and community leaders. When two of the experts/ community leaders responded, it was clear that both of them thought he was the course teacher. This made him remarkably proud, and he took on a leadership role in the project. Even after we completed the project, he continued to complete all of his civics work, and he showed remarkable academic growth.

A middle school teacher explained how SEL and STEM skills intersected during PC to strengthen students’ confidence.

My students learned more about strengthening their skills in communication. Using research, students realized the impact of statistics to respond and make a difference in solving social issues. I think students’ experiences made them more confident in moving to high school.

### **Teachers’ Efficacy Implementing Civics-Related SEL**

Teachers who have a strong sense of self-efficacy feel the most empowered to integrate SEL into the curriculum (Holmes, 2021). The pandemic exacerbated existing difficulties and created novel impediments that eroded teacher efficacy. Educators reported that students were exhibiting higher-than-usual levels of emotional distress manifested in signs of depression, loneliness, anxiety, and elevated rates of truancy that caused them to disengage from learning (McGraw Hill, 2021). Nearly two-thirds of educators surveyed during the COVID lockdown

indicated that integrating SEL into academic curricula was challenging (Meuers, 2023). Research revealed that teachers' self-efficacy declined over the course of the academic year during the pandemic as the impact on students' wellbeing increased (McGraw Hill, 2021). Levels of self-efficacy were lower than in prior years and have remained diminished (Pressley and Ha, 2021). High-need students faced obstacles to developing SEL competencies both in and outside of the classroom that worsened during the pandemic. Teachers in the present study worked with large numbers of high-need students whose circumstances presented hurdles for civic learning, especially when classes were held virtually (Jagers, Rivas-Drake, and Williams, 2019).

Teachers' self-efficacy in imparting SEL competencies was examined in the present research. The PC PD program conveyed best practices for teaching civics-related SEL competencies to students and integrating SEL into the PC curriculum. Following their participation in the PCRCP, 77% of teachers agreed that Project Citizen contributed to their students social and emotional learning, while 23% gave a neutral response. Teachers generally felt more efficacious about their ability to convey content knowledge, implement effective instructional strategies, and foster respectful discourse than they did about their capacity to instruct students who are difficult to reach, encourage students to civically engage, and find and contribute resources within their schools. PC teachers remained more efficacious after completing the academic year than control group teachers. The fact that they were part of a learning community and met regularly with program staff, mentors, and other educators may have provided support that helped them to maintain a greater sense of self-efficacy. They had an outlet where they could discuss challenges, share successes, and receive advice.

## **Measurement**

Teacher self-efficacy in imparting SEL competencies was measured across six dimensions consisting of their ability to 1) convey civic content knowledge, 2) promote student self-care and self-management, 3) develop students' relationship skills, 4) promote respectful classroom discourse, 5) encourage student civic engagement, and 6) access and provide educational resources. Teachers were asked how much they felt they could do (1 very little, 2 some, 3 a great deal) about each of eighteen items. One item recorded how well they felt they could convey knowledge of American government to students. Efficacy related to promoting student self-care and self-management was measured by six items indicating teachers' sense that they could 1) get through to the most difficult students, 2) keep students on task on difficult assignments, 3) promote learning where there is a lack of support from the home, 4) overcome the influence of adverse community conditions on students' learning, 5) increase students' memory of what they have been taught in previous lessons, and 6) motivate students who show low interest in schoolwork. Four items tapped teachers' efficacy regarding their ability to develop students' relationship skills. Teachers reported on their ability to 1) implement active learning strategies in their classrooms, 2) help their students to think critically, 3) get students to work together, and 4) control disruptive behavior in the classroom. Teachers' efficacy in fostering respectful classroom discourse and behavior was measured by their ability to 1) respond to difficult questions from students, 2) hold respectful and civil discussions on difficult topics, and 3) use strategies for addressing sensitive issues of diversity. Teachers indicate how well they were able to encourage students to 1) become involved in their community and 2) participate in the electoral process. Finally, teachers were asked about their potential to access and provide resources in their schools by 1) helping other teachers with their teaching skills and



2) finding resources for working with students who have unique learning needs. An additive teacher self-efficacy index was created from all eighteen items. The index ranged from 1 (low self-efficacy) to 27 (high self-efficacy). The reliability (Cronbach's  $\alpha$ ) was acceptable at .85 or greater for all cohorts. (See Table 51.)

**Table 51**  
**Self-Efficacy Index Range and Reliability**

	Index Range	Pretest Cronbach's $\alpha$	Posttest Cronbach's $\alpha$
<b>Cohort 1</b>	1-27	.85	.85
<b>Cohort 2</b>	1-27	.88	.91
<b>Cohort 3</b>	1-27	.87	.92

### Analysis

The self-efficacy of teachers participating in PC, as measured by the index, increased over the course of the PCRCP. (See Table 52.) The average pretest and posttest scores for both the PC and control groups were in the upper third of the distribution. The mean scores for the PC recipients on the self-efficacy index were significantly higher on the posttest than pretest in all three cohorts. It is noteworthy that the positive gains in efficacy within cohort diminished over the years of the program as the pandemic wore on. The pretest/posttest percentage change was 15% in cohort 1, 9% in cohort 2, and 7% in cohort 3. The effect sizes of .68, .22, and .28 corresponded to improvement index scores of +25, +9, and +11 percentile points. In contrast, the control group teachers' mean scores on the self-efficacy index decreased from pretest to posttest in every study year. However, the pretest/posttest difference of means for the control group teachers was only statistically significant in cohort 2.

**Table 52**  
**Teacher Self-Efficacy Index by Condition**  
**Difference of Means**

	Cohort 1		Cohort 2		Cohort 3	
	PC	Control	PC	Control	PC	Control
Pretest $\bar{x}$	19.29	20.15	18.77	20.61	20.51	18.80
Pretest SD	5.44	4.65	7.60	5.09	4.50	4.99
Posttest $\bar{x}$	22.24	19.89	20.52	18.56	21.87	17.53
Posttest SD	4.79	6.04	5.66	5.13	4.29	5.41
$\bar{x}$ Difference	2.95	.26	1.74	-2.04	1.36	-1.26
Sign. Difference	.00	NS	.00	.02	.04	NS
Percentage Change	15%	-1%	9%	-10%	7%	-7%
Effect Size	.68	-.07	.22	-.44	.28	-.21
Improvement Index	+25	-3	+9	-17	+11	-8
Pre/Post Correlation	.65	.79	.34	.61	.41	.37
Sign. Correlation	.00	.00	.00	.00	.00	.00
n	36	27	34	27	39	33

The ANCOVA analysis showed that the adjusted posttest means for the PC group were significantly ( $p \leq .01$ ) higher on the self-efficacy index than those of the control group for all three cohorts. In cohort 1, the adjusted posttest mean difference was 2.98, representing a difference between the groups of 13%. The effect size of .50 corresponded to an improvement index of +19. The cohort 2 adjusted mean difference was 2.59 and the percentage difference was 13%. The effect size of .42 translated an improvement index score of +16. The adjusted posttest mean difference was highest in cohort 3. The PC group scored, on average, 3.65 points higher on the self-efficacy index than the control group. The percentage difference between the groups was 17%, the effect size was .76, and the improvement index was +28 percentile points. (See Appendix B, Table B21.)

## Self-Care and Self-Management

PC teachers' perceptions of their ability to promote student self-care and self-management by working effectively with students under difficult circumstances increased on all indicators in cohort 1, but the results were mixed for the subsequent cohorts (See Table 52.) Notably, the percentage of PC teachers in the first year who felt they had a great deal of ability to overcome the influence of adverse community conditions on learning increased from 32% on the pretest to 54% on the posttest. Teachers' perceptions of their potential to motivate students with low interest in schoolwork increased in all three cohorts. The pretest/posttest increase teachers responding "a great deal" went from 35% to 60% in cohort 1, 36% to 45% in cohort 2, and 50% to 60% in cohort 3. A decline in PC teachers' self-efficacy was noted in cohorts 2 and 3 for getting through to difficult students, keeping students on task on difficult assignments, promoting learning when there is a lack of support at home, and increasing students' memory of previous lessons.

Control group teachers' perceptions of their ability promote student learning under adverse conditions differed somewhat for those of the PC group. There were also notable differences across study years. In cohort 1, the percentage of teachers responding "a great deal" increased between the pretest and posttest for getting through to difficult students, keeping students on task on difficult assignments, increasing students' memory of previous lessons, and motivating students with low interest. Control group teachers' views of their potential to keep students on task on difficult assignments was the only item with a positive gain on the pretest (from 67% to 77%). The decrease in efficacy was substantial for promoting learning when there is a lack of support at home, overcoming adverse community conditions, increasing students' memory of previous lessons, and motivating students with low interest. Control group teachers' sense of efficacy for getting through to difficult students, their ability to overcome adverse community conditions, and their potential to motivate students with low interest increased in cohort 3. On all but one of these variables (getting through to difficult students), less than half of the control teachers felt strongly that they were able to promote student learning.

**Table 52**  
**Self-Care and Self-Management**  
**Percentage of Teachers Responding “A Great Deal”**

<b>Project Citizen Teachers</b>						
	<b>Cohort 1</b>		<b>Cohort 2</b>		<b>Cohort 3</b>	
	<b>Pretest</b>	<b>Posttest</b>	<b>Pretest</b>	<b>Posttest</b>	<b>Pretest</b>	<b>Posttest</b>
Get through to difficult students	64%	71%	66%	55%	72%	54%
Keep students on task on difficult assignments	56%	76%	75%	68%	65%	58%
Promote learning when lack of support at home	48%	60%	60%	48%	70%	63%
Overcome adverse community conditions	32%	54%	42%	42%	46%	46%
Increase memory of previous lessons	43%	54%	73%	48%	60%	58%
Motivate students with low interest	35%	60%	36%	45%	50%	61%

<b>Control Group Teachers</b>						
	<b>Cohort 1</b>		<b>Cohort 2</b>		<b>Cohort 3</b>	
	<b>Pretest</b>	<b>Posttest</b>	<b>Pretest</b>	<b>Posttest</b>	<b>Pretest</b>	<b>Posttest</b>
Get through to difficult students	51%	56%	67%	55%	43%	58%
Keep students on task on difficult assignments	70%	78%	67%	77%	57%	48%
Promote learning when lack of support at home	48%	39%	67%	37%	54%	38%
Overcome adverse community conditions	41%	43%	48%	29%	20%	31%
Increase memory of previous lessons	41%	47%	67%	51%	48%	44%
Motivate students with low interest	33%	56%	52%	33%	26%	44%

## Relationship Skills

A majority of PC and control group teachers indicated that they had a great deal of ability to implement active learning strategies, help students to think critically, get students to work together, and control disruptive behavior in the classroom. (See Table 53.) The PC teachers’ perceptions of their efficacy in these areas increased on most items and remained the same when it was already at 90%. In cohort 3, PC teachers’ perceptions of their ability to control disruptive behavior in their classroom declined, as 82% indicated “a great deal” on the pretest compared to

74% on the posttest. In contrast, the percentage of control group teachers responding “a great deal” dropped from pretest to posttest with a couple of exceptions (help students think critically in cohort 1 and implement active learning strategies in cohort 3). Control group teachers’ perceptions of their ability to control disruptive behavior dropped from 82% to 74%. It is reasonable to assume that the PC teachers felt more efficacious because they were part of a learning community that was reinforcing these pedagogical practices and provided support during the challenging period of the pandemic.

**Table 53**  
**Relationship Skills**  
**Percentage of Teachers Responding “A Great Deal”**

Project Citizen Teachers						
	Cohort 1		Cohort 2		Cohort 3	
	Pretest	Posttest	Pretest	Posttest	Pretest	Posttest
Implement active learning strategies	86%	95%	84%	88%	90%	90%
Help students think critically	84%	89%	74%	78%	87%	88%
Get students to work together	64%	83%	63%	77%	70%	76%
Control disruptive behavior in classroom	81%	87%	78%	84%	82%	74%

Control Group Teachers						
	Cohort 1		Cohort 2		Cohort 3	
	Pretest	Posttest	Pretest	Posttest	Pretest	Posttest
Implement active learning strategies	89%	78%	85%	74%	77%	77%
Help students think critically	89%	91%	85%	70%	83%	75%
Get students to work together	82%	60%	73%	52%	82%	69%
Control disruptive behavior in classroom	93%	87%	93%	88%	80%	69%

## Respectful Discourse

Teachers strongly believed that they could maintain a respectful classroom environment. Most PC teachers felt they had a great deal of capacity to respond to difficult questions, hold civil discussions, and address sensitive issues of diversity. (See Table 54.) For the most part, their self-efficacy related to respectful discourse either increased or remained stable at a high level over time. Control group teachers generally felt they had a robust capacity to maintain a respectful classroom. However, unlike the PC teachers, their self-efficacy declined on most of the indicators. In cohorts 1 and 3, the percentage of control teachers answering “a great deal”

decreased for responding to difficult questions and holding civil discussions. Control teachers in cohort 2 had a similar pattern, except that there was no pretest/posttest change in holding respectful discussions.

**Table 54**  
**Respectful Discourse**  
**Percentage of Teachers Responding “A Great Deal”**

<b>Project Citizen Teachers</b>						
	<b>Cohort 1</b>		<b>Cohort 2</b>		<b>Cohort 3</b>	
	<b>Pretest</b>	<b>Posttest</b>	<b>Pretest</b>	<b>Posttest</b>	<b>Pretest</b>	<b>Posttest</b>
Respond to difficult questions	92%	96%	91%	94%	87%	92%
Hold respectful/civil discussions	81%	89%	91%	91%	87%	92%
Address sensitive issues of diversity	78%	84%	74%	81%	82%	92%

<b>Control Group Teachers</b>						
	<b>Cohort 1</b>		<b>Cohort 2</b>		<b>Cohort 3</b>	
	<b>Pretest</b>	<b>Posttest</b>	<b>Pretest</b>	<b>Posttest</b>	<b>Pretest</b>	<b>Posttest</b>
Respond to difficult questions	89%	74%	89%	74%	77%	66%
Hold respectful/civil discussions	93%	82%	85%	85%	77%	69%
Address sensitive issues of diversity	67%	74%	74%	78%	77%	77%

## **Students’ Social and Emotional Learning**

The PC curriculum intervention was designed to promote students’ acquisition of a range of civics-related SEL competencies. Students’ development of problem-solving skills was central to their goal of identifying and investigating solutions to a pressing issue in their school or community.

### **Problem-Solving Skills**

Problem-solving skills are SEL competencies are central to curricula that employ PBL. Acquisition of these competencies was a focal outcome of the PC intervention. Both middle and high school students had relatively high scores on problem-solving at the outset. Middle and high school students who participated in PC made modest, statistically significant gains in their ability to solve problems.

## Measurement

Students were asked whether they were able to perform a variety of tasks if they faced a problem in their community. These tasks were integral to the PC curriculum. Students indicated if they felt able to: 1) identify the problem, 2) research the problem, 3) get other people to care about the problem, 4) work cooperatively with others to solve the problem, 5) develop a plan of action for addressing the problem, 6) evaluate alternative solutions to the problem, and 7) attend a meeting about the problem. For each item, students could respond: 1 I definitely could not, 2 I probably could not, 3 I'm not sure if I could, 4 I probably could, and 5 I definitely could. These items were combined in an additive index of problem-solving skills. The problem-solving index ranged from 1 (definitely could not) to 29 (definitely could). The index meets WWC standards for reliability for all study years. (See Table 55.)

**Table 55**  
**Problem-Solving Index Range and Reliability**

	Middle School		
	Index Range	Pretest Cronbach's $\alpha$	Posttest Cronbach's $\alpha$
<b>Cohort 1</b>	1-29	.87	.87
<b>Cohort 2</b>	1-29	.88	.90
<b>Cohort 3</b>	1-29	.88	.87
	High School		
	Index Range	Pretest Cronbach's $\alpha$	Posttest Cronbach's $\alpha$
<b>Cohort 1</b>	1-29	.87	.91
<b>Cohort 2</b>	1-29	.88	.87
<b>Cohort 3</b>	1-29	.89	.89

## Analysis

The gains in problem-solving skills for middle school students who experienced the PC curriculum were modest and statistically significant. (See Table 56.) Students' mean pretest scores for both groups were at the higher end of the scale, especially in cohorts 1 and 2. The increase in pretest/posttest mean scores for the PC students was .57, .85, and .93 across the three cohorts. These pretest/posttest mean differences were statistically significant at  $p \leq .01$ . The percentage change for the PC group in each cohort was small at 3%, 4% and 5%, respectively. The effect sizes (Hedge's  $g$ ) were .12, .14, and .14, which corresponded to improvement index scores of +5, +6 and +6 percentile points. In comparison, the pretest/posttest mean differences were not statistically significant for the control group in cohorts 1 and 2. The difference of means of .61 was statistically significant for the control group in cohort 3. The pretest/posttest percentage change was 3% and the improvement index was +3 percentile points. The ANCOVA analysis examined the difference in adjusted posttest mean scores for the middle school PC and control group students. The adjusted posttest mean difference was small and statistically significant for cohort 1. However, the difference of mean scores between the groups was not statistically significant for the subsequent cohorts. (See Appendix B, Table B22.)

**Table 56**  
**Middle School Students' Problem-Solving Skills by Condition**  
**Difference of Means**

	Cohort 1		Cohort 2		Cohort 3	
	PC	Control	PC	Control	PC	Control
Pretest $\bar{x}$	20.87	19.82	19.12	19.60	17.69	17.64
Pretest SD	5.27	5.29	6.10	5.90	6.08	6.03
Posttest $\bar{x}$	21.45	19.85	19.89	19.96	18.62	18.25
Posttest SD	5.00	5.06	5.53	5.02	6.05	5.83
$\bar{x}$ Difference	.57	.03	.85	.36	.93	.61
Sign. Difference	.02	NS	.00	NS	.00	.04
Percentage Change	3%	<1%	4%	2%	5%	3%
Effect Size	.12	.01	.14	.06	.14	.08
Improvement Index	+5	+1	+6	+2	+6	+3
Pre/Post Correlation	.44	.52	.49	.41	.43	.26
Sign. Correlation	.00	.00	.00	.00	.00	.00
n	303	325	309	404	445	314



The trends for high school students were similar to the middle school findings. (See Table 57.) High school students' pretest scores were near the upper end of the index, indicating that they generally felt capable of acting to solve a problem in their community prior to taking their civics class. The improvement in PC students' mean scores on the problem-solving index was modest and statistically significant for all three cohorts. The difference of means was .36 for cohort 1, .42 for cohort 2, and .65 for cohort 3. The percentage change and improvement index scores were small across the board. The effect sizes (Hedge's *g*) for the PC students' problem-solving skills were .08, .08, and .12, corresponding to improvement index scores of +3, +3, and +5 percentile points. The control groups' pretest/posttest mean differences were not statistically significant for cohorts 1 and 2. Cohort 3 was the only instance where the increase in the control group's scores was slightly higher than that of the PC group, although the improvement index was one percentile point lower.

**Table 57**  
**High School Students' Problem-Solving Skills by Condition**  
**Difference of Means**

	Cohort 1		Cohort 2		Cohort 3	
	PC	Control	PC	Control	PC	Control
Pretest $\bar{x}$	21.91	21.02	21.11	20.86	19.73	19.20
Pretest SD	4.50	5.33	4.75	4.83	5.21	5.53
Posttest $\bar{x}$	22.27	20.79	21.54	20.73	20.39	19.90
Posttest SD	4.57	5.64	5.06	5.31	5.63	5.69
$\bar{x}$ Difference	.36	-.23	.42	.13	.65	.70
Sign. Difference	.02	NS	.05	NS	.00	.00
Percentage Change	2%	-1%	2%	<1%	3%	4%
Effect Size	.08	-.04	.08	.02	.12	.10
Improvement Index	+3	-2	+3	+1	+5	+4
Pre/Post Correlation	.52	.37	.38	.48	.47	.27
Sign. Correlation	.00	.00	.00	.00	.00	.00
n	631	287	420	311	501	325

The ANCOVA analysis for high school students revealed that the adjusted posttest mean scores for the PC group were significantly higher than the control group scores for cohorts 1 and 2. The percentage difference was 5% in cohort 1, with an effect size (Hedge's *g*) of .27 that corresponded to an improvement index of +10 percentile points. In cohort 2, the percentage difference was 8%, the effect size was .34, and the improvement index was +13 percentile points. The difference in adjusted PC and control group posttest means was not statistically significant in cohort 3. (See Appendix B, Table B23.)

### Civic Expression Skills

Students' ability to express and share their views is a central element of the PC curriculum. Students' average pretest scores on the civics expression index were near the center of the distribution. The civic expression skills of both middle and high school students who received the PC intervention improved significantly. The gains for middle school students in the control group were smaller across cohorts, and nonsignificant in cohort 1. The civic expression skills of high school students in the control group did not change significantly from pretest to posttest in cohorts 1 and 2. The improvement in the control group's average civic expression scores was comparable to the PC group in cohort 3.

### Measurement

The study included a battery of six items measuring civic expression skills. Students were asked if they felt they could 1) express their views in front of a group of people, 2) write a letter to a local news outlet, 3) organize a petition, 4) contact a government official, 5) use social media to publicize the problem, and 6) use social media to organize people to take action to solve the problem. The responses to the individual items were 1 I definitely can't, 2 I probably can't, 3



I am not sure if I can, 4 I probably can, and 5 I definitely can. The six items were added to form a civic expression index that ranged from 1 (definitely cannot) to 25 (definitely can). The index reliability (Cronbach's  $\alpha$ ) was over .86 or greater for all cohorts and grade levels. (See Table 58.)

**Table 58**  
**Civic Expression Index Range and Reliability**

	Middle School		
	Index Range	Pretest Cronbach's $\alpha$	Posttest Cronbach's $\alpha$
<b>Cohort 1</b>	1-25	.87	.86
<b>Cohort 2</b>	1-25	.88	.86
<b>Cohort 3</b>	1-25	.87	.88
	High School		
	Index Range	Pretest Cronbach's $\alpha$	Posttest Cronbach's $\alpha$
<b>Cohort 1</b>	1-25	.87	.89
<b>Cohort 2</b>	1-25	.88	.90
<b>Cohort 3</b>	1-25	.88	.91



## Analysis

Middle school students' scores on the civic expression index hovered around the midpoint of the scale at the outset of the study. Students who took part in PC had notable gains in civic expression skills. The increases in their scores were greater than those of the control group students. (See Table 59.) The pretest/posttest improvements in PC students' scores on the civic expression skills index were 1.22, 1.50, and 1.50, and were statistically significant ( $p \leq .01$ ) across the three cohorts. The percentage change was 9% for cohort 1, 11% for cohort 2, and 13% for cohort 3. The effect sizes (Hedge's  $g$ ) were similar at .23, .24, and .22 for the three cohorts, and the improvement index score was +9 percentile points across the board. The pretest/posttest mean differences were notably smaller for the control group at .40, .66, and .81, and were statistically significant for cohorts 2 and 3, but not cohort 1. The percentage change was 3% in cohort 1, 5% in cohort 2, and 7% in cohort 3. The effect sizes were .07, .11, and .10, with corresponding improvement index scores of +3, +4, and +4 percentile points.

**Table 59**  
**Middle School Students' Civic Expression Skills by Condition**  
**Difference of Means**

	Cohort 1		Cohort 2		Cohort 3	
	PC	Control	PC	Control	PC	Control
Pretest $\bar{x}$	14.29	13.85	13.24	13.58	12.02	11.86
Pretest SD	5.98	6.11	6.31	6.27	6.23	6.15
Posttest $\bar{x}$	15.52	14.25	14.75	14.24	13.53	12.67
Posttest SD	5.82	.56	5.79	5.59	6.20	6.16
$\bar{x}$ Difference	1.22	.40	1.50	.66	1.50	.81
Sign. Difference	.00	NS	.00	.02	.00	.03
Percentage Change	9%	3%	11%	5%	13%	7%
Effect Size	.23	.07	.24	.11	.22	.10
Improvement Index	+9	+3	+9	+4	+9	+4
Pre/Post Correlation	.58	.54	.45	.46	.38	.21
Sign. Correlation	.00	.00	.00	.00	.00	.00
n	289	315	300	389	439	316

At the middle school level, the ANCOVA analysis indicated that the adjusted mean difference in posttest civic expression skills was statistically significant in cohorts 1 and 3. The percentage difference between the PC and control group adjusted posttest mean scores for cohort 1 was 6%, the effect size was .17, and the improvement index was +7 percentile points. The findings for cohort 3 were similar, as there was a 6% difference in the adjusted posttest means scores between the groups, an effect size of .15, and an improvement index of +6 percentile points. The difference of adjusted posttest means in cohort 2 was small and nonsignificant. (See Appendix B, Table B24.)

High school students' scores on the civic expression skills index improved significantly for the PC group in every cohort. (See Table 60.) In cohort 1, the pretest/posttest mean difference was 1.08 for PC students, representing a 7% increase. The effect size (Hedge's *g*) was .24 and the improvement index was +7 percentile points. The PC group's mean difference in cohort 2 was 1.24, the percentage change was 8%, the effect size was .21, and the improvement index was +8. The difference of means was not statistically significant for the control group in cohorts 1 and 2. In cohort 3, the control group mean difference (1.35) exceeded that of the PC group (1.06). The difference of means was statistically significant ( $p \leq .01$ ) for both groups. The percentage change for the PC students was 8% compared to 10% for the control group. The improvement indexes were .17 and .20, respectively, and corresponded to improvement index scores of +7 and +8 percentile points.

**Table 60**  
**High School Students’ Civic Expression Skills by Condition**  
**Difference of Means**

	Cohort 1		Cohort 2		Cohort 3	
	PC	Control	PC	Control	PC	Control
Pretest $\bar{x}$	16.32	15.33	15.32	15.33	13.74	13.00
Pretest SD	5.24	5.83	5.45	5.65	5.81	6.20
Posttest $\bar{x}$	17.41	15.67	16.57	15.42	14.80	14.36
Posttest SD	4.99	5.99	5.51	5.62	6.12	6.27
$\bar{x}$ Difference	1.08	.34	1.24	.09	1.06	1.35
Sign. Difference	.00	NS	.00	NS	.00	.00
Percentage Change	7%	2%	8%	<1%	8%	10%
Effect Size	.24	.05	.21	.02	.17	.20
Improvement Index	+9	+2	+8	+1	+7	+8
Pre/Post Correlation	.61	.44	.43	.47	.48	.44
Sign. Correlation	.00	.00	.00	.00	.00	.00
n	627	285	417	313	497	319

Comparing the adjusted posttest mean scores from the ANCOVA analysis demonstrated that the PC students’ scores on the civic expression skills index were significantly higher than the control groups’ scores for cohorts 1 and 2. The percentage difference in the groups’ scores was 7% in cohort 1 and 11% in cohort 2. The effect size in cohort 1 was .25 corresponding to an improvement index of +6 percentile points. In cohort 2, the effect size was .31 and the improvement index was +12 percentile points. The difference in adjusted posttest means between PC and control group students was nonsignificant in cohort 3. (See Appendix B, Table B25.)

## STEM SKILLS

The U.S. Department of Education’s STEM policy goals advise that “all young people should be prepared to think deeply and to think well so that they have the chance to become the innovators, educators, researchers, and leaders who can solve the most pressing challenges facing our nation and our world, both today and tomorrow” (U.S. Department of Education 2016: online). The Department proposes a roadmap for the future of STEM education, stating that “the complexities of today’s world require all people to be equipped with a new set of core knowledge and skills to solve difficult problems, gather and evaluate evidence, and make sense of information they receive from varied print, and increasingly, digital media.” (U.S. Department of Education, 2022: i). PC addresses these requirements directly as the curriculum is designed to build students’ capacity to use their mathematical, technological, and scientific skills to tackle important issues and to engage others in developing solutions to problems faced by society.

Prior research into the outcomes associated with integrating STEM into civic education and social studies programs is limited. This is likely due to the paucity of programs and curricula that intentionally integrate STEM or STEAM into the civics curriculum. More effort has been made to incorporate civics and public policy content into STEM classes than the reverse (Li, et al., 2020). Increasing numbers of science and technology programs are aimed at preparing students for public engagement (Goldenkoff, 2020; Ross and Fried, 2022). Further, interviews with civics teachers for this study reveal that they have a limited sense of what STEM means, and as such underestimate the extent to which they are teaching students these skills.

## **Teachers' Integration of STEM Skills in the Civic Curriculum**

PC is well-suited to convey STEM skills to students. Active learning teaching methodologies, especially the use of PBL, have been found to be suitable and effective for integrating STEM across disciplines outside of the cognate disciplines (Perales and Arostegui, 2021). The present study bears out this assumption, as teachers regularly had students use their math, science and technology skills when researching their problem and devising policy solutions.

Teachers related their experiences with integrating STEM into the PC curriculum. A middle school teacher recounted:

My students learned that what they really want is possible and they have something to do with whether it happens or doesn't happen. This 5th grade group came came up with a problem to tackle, created surveys, met with our principal and applied for a garden grant. During the grant process, my students learned so many life skills. They had to find out our school capacity, find out how many kids have free and reduced lunch, interview staff about out school and submit a plan for the garden. Every part of this project was a learning experience for this group.

A high school teacher shared:

My students realized the challenges of trying to obtain meaningful data through surveys and also the struggles with trying to contact stakeholders and adults connected to their topics. Some people who they wanted to interview didn't get back to them and they found that frustrating. I think they were pleased with how the project came together in the end though.

## **Measurement**

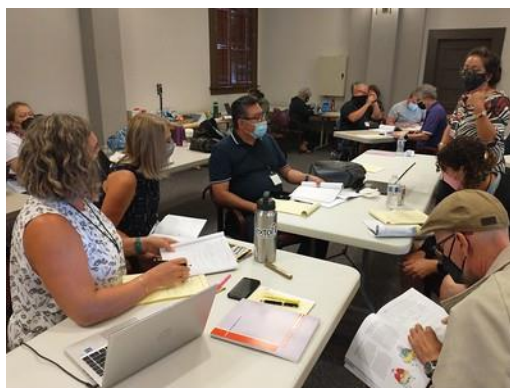
Three questions about teachers' use of STEM in their civics classes were included in the cohort 3 study. One item asked if teachers had students use STEM skills when addressing a problem in their school or community. On the pretest, they reflected on what they had done over the previous two years. On the posttest, they focused on the current academic year. The item was measured as a dichotomy scored 1 if they used STEM skills and 0 if they did not. A second item asked how much emphasis teachers placed on having students apply STEM skills to address a problem. The response categories were 1 not much, 2 some, 3 a great deal. Finally, teachers were

asked how prepared they felt to integrate STEM skills into the civics, social studies, and/or history curriculum. The responses were 1 very little/not at all, 2 somewhat, and 3 very prepared. On the cohort 2 posttest, teachers were asked if they felt they were better able to incorporate STEM competencies into the curriculum at the end of that academic year. The response categories were 1 disagree, 2 neither agree nor disagree, and 3 disagree. Teachers also were asked about their use of specific STEM-related pedagogies that are suited to the civics classroom. The items asked how often teachers had their students 1) conduct surveys and 2) use digital technology to engage in community affairs. The response categories were 1 never, 2 rarely, 3 sometimes, and 4 frequently.

## Analysis

PC teachers in cohort 3 became more inclined to have their students use STEM skills after participating in the professional development program. (See Table 61.) The percentage of teachers indicating that they had their students use STEM skills doubled from 25% to 50%. The percentage of control group teachers saying that they had their students use STEM skills remained constant at 34%. Half of PC teachers did not place much emphasis on having students apply STEM skills on the pretest, a number that dropped to 28% on the posttest. There was a decline in the percentage of PC teachers who responded that they placed a great deal of emphasis on STEM skills from 22% to 11%. However, the number who replied that they gave some attention to STEM increased from 28% to 61%. The percentage of control group teachers who emphasized STEM skills a great deal declined from 15% to 7%. The number who gave little attention to STEM declined from 59% to 45%, while those who gave some emphasis to STEM increased from 25% to 48%.

In cohort 2, 40% of teachers agreed that they were better able to integrate STEM into the civic curriculum after participating in PC. Thirty-seven percent of PC teachers gave a neutral response, and 33% disagreed. Teachers in cohort 3 were asked how prepared they were to integrate STEM into their classes. A much higher percentage of PC teachers felt very prepared on the posttest (42%) than on the pretest (3%). The number indicating very little or not at all declined from 66% preprogram to 29% post-program. The percentage of control group teachers who reported feeling very prepared to integrate STEM into the curriculum remained fairly stable from pretest (12%) to posttest (10%). The percentage of control group teachers stating very little/not at all declined from 73% to 62%. The percentage of control teachers who felt somewhat prepared increased from 15% to 28%.



**Table 61**  
**Teachers Integrating STEM in the Curriculum**  
**Cohort 3**

STEM Skills	Project Citizen		Control Group	
	Pretest	Posttest	Pretest	Posttest
<b>Had students use STEM skills</b>	25%	50%	34%	34%
<b>Emphasis place on having students apply STEM skills</b>				
A Great Deal	22%	11%	15%	7%
Some	28%	61%	26%	48%
Not Much	50%	28%	59%	45%
<b>Integrating STEM skills into the civics curriculum</b>				
Very	3%	42%	12%	10%
Somewhat	33%	29%	15%	28%
Very Little/Not at All	66%	29%	73%	62%
n	36	27	39	33

PC teachers were more inclined to have their students conduct surveys during the year that they taught the curriculum. (See Table 62.) In cohort 1, the percentage of teachers who used surveys at least sometimes increased from 51% to 88%. In cohort 2, 6% of teachers reported that they frequently had their students conduct surveys on the pretest compared to 16% on the posttest. The percentage indicating that the never used surveys in their classes declined from 21% to 9%. The findings were somewhat less pronounced for cohort 3, but still indicated a greater propensity for teachers to have students conduct surveys.

**Table 51**  
**Had Students Conduct Surveys**  
**Project Citizen Teachers**

Conduct Surveys	Cohort 1		Cohort 2		Cohort 3	
	Pretest	Posttest	Pretest	Posttest	Pretest	Posttest
Frequently	8%	20%	6%	16%	15%	16%
Sometimes	43%	68%	56%	49%	42%	53%
Rarely	32%	14%	18%	26%	25%	24%
Never	16%	--	21%	9%	18%	8%
n	36	27	34	27	39	33

Unlike the PC teachers, control group teachers' use of surveys in their civics classes did not change much from pretest to posttest. (See Table 52.) The percentage of teachers using surveys frequently declined from 19% to 9% in cohort 1 and from 12% to zero in cohort 2. The

percentage of control group teachers who never used surveys increased markedly in cohort 2 from 12% to 30%.

**Table 52**  
**Had Students Conduct Surveys**  
**Control Group Teachers**

Conduct Surveys	Cohort 1		Cohort 2		Cohort 3	
	Pretest	Posttest	Pretest	Posttest	Pretest	Posttest
<b>Frequently</b>	19%	9%	12%	--	4%	7%
<b>Sometimes</b>	33%	41%	54%	44%	32%	34%
<b>Rarely</b>	33%	36%	23%	23%	32%	27%
<b>Never</b>	15%	14%	12%	30%	32%	32%
<b>n</b>	36	27	34	27	39	33

Teachers who taught PC were more likely to have their students use technology to engage in the community after the PD program. (See Table 53.) The increase in the percentage of PC teachers who had their students use technology for civic engagement frequently or sometimes went from 33% to 63% in cohort 1, 41% to 62% in cohort 2, and 37% to 48% in cohort 3. The number of teachers who never had their students use technology for engagement declined in cohort 1 from 36% to 14%, in cohort 2 from 21% to 16%, and in cohort 3 from 38% to 24%.

**Table 53**  
**Had Students Use Technology to Engage in the Community**  
**Project Citizen Teachers**

Use Technology to Engage	Cohort 1		Cohort 2		Cohort 3	
	Pretest	Posttest	Pretest	Posttest	Pretest	Posttest
<b>Frequently</b>	5%	22%	12%	16%	7%	14%
<b>Sometimes</b>	28%	41%	29%	46%	30%	34%
<b>Rarely</b>	31%	24%	38%	23%	25%	29%
<b>Never</b>	36%	14%	21%	16%	38%	24%
<b>n</b>	36	27	34	27	39	33

Except for cohort 1, control group teachers were somewhat less likely to have their students use technology to engage in the community during the period of the study than they had been in prior years. (See Table 54.) A higher percentage of cohort 1 control teachers reporting having their students use technology frequently to engage in the community on the posttest (22%) than on the pretest (8%). However, the percentage of teachers responding frequently or sometimes declined slightly from 54% to 52%. Only 4% of teachers in cohort 2 and none in cohort 3 had their students use technology to engage. The percentage of control group teachers who responded frequently or sometimes declined from 37% to 26% in cohort 2 and from 29% to 24% in cohort 3.

**Table 54**  
**Had Students Use Technology to Engage in the Community**  
**Control Group Teachers**

Use Technology to Engage	Cohort 1		Cohort 2		Cohort 3	
	Pretest	Posttest	Pretest	Posttest	Pretest	Posttest
<b>Frequently</b>	8%	22%	11%	4%	3%	--
<b>Sometimes</b>	46%	30%	26%	22%	26%	24%
<b>Rarely</b>	19%	26%	22%	19%	34%	41%
<b>Never</b>	27%	27%	41%	56%	37%	35%
<b>n</b>	36	27	34	27	39	33

### Student's Use of STEM

The PC curriculum offered opportunities for students to acquire STEM skills as they researched their policy problems and developed solutions. STEM-related activities included students examining scientific evidence, collecting data from surveys, performing rudimentary statistical analyses, and gathering scientific evidence that they used to support their arguments. Students provided exhibits that required the use of STEM proficiencies, including tech skills, in their project portfolios. PC students became more aware of the relevance of STEM to addressing issues in their community. They were better able to make the connection between STEM and social studies and history.

### Measurement

Students' use of STEM in the civics classroom was measured by five survey items to which students could 1 disagree strongly, 2 disagree, 3 neither agree nor disagree, 4 agree, and 5 strongly agree. Students' belief in their ability to use STEM skills to address policy issues was measured by three items: 1) I can use my math skills to work on problems in my community; 2) I can use my science skills to work on problems in my community; and 3) I can use my skills with technology to work on problems in my community. A STEM index was created that combined these three measures. The index ranged from a low score of 1 (disagree strongly) to a high score of 15 (agree strongly). The reliability of the index (Cronbach's  $\alpha$ ) was acceptable at .80 or greater for every condition. (See Table 55.) Two additional items tapped students' awareness of the relationship of STEM to civics: 1) my knowledge of math and science helps me to understand policy issues and 2) I use math and science skills in my social studies and history classes.



**Table 55**  
**STEM Index Range and Reliability**

	Middle School		
	Index Range	Pretest Cronbach's $\alpha$	Posttest Cronbach's $\alpha$
<b>Cohort 1</b>	1-15	.80	.81
<b>Cohort 2</b>	1-15	.80	.81
<b>Cohort 3</b>	1-15	.81	.82
	High School		
	Index Range	Pretest Cronbach's $\alpha$	Posttest Cronbach's $\alpha$
<b>Cohort 1</b>	1-15	.83	.81
<b>Cohort 2</b>	1-15	.81	.84
<b>Cohort 3</b>	1-15	.80	.81

### Analysis

Students were more likely to believe that they could use STEM skills to address problems in their community following their participation in PC. Middle school students' scores on the STEM index increased from pretest to posttest for all cohorts. (See Table 56.) The effects were moderate and statistically significant. The pretest/posttest mean difference was .53 for cohort 1, .47 for cohort 2, and .43 for cohort 3. The effect sizes were .50, .46, and .38, which corresponded to improvement index scores of +8, +6, and +5 percentile points. In contrast, the pretest/posttest mean difference for the control group students either declined (cohort 1), was notably smaller than the for the PC group (cohort 2) or was negligible and nonsignificant (cohort 3).

**Table 56**  
**Middle School Students STEM Index by Condition**  
**Difference of Means**

	Cohort 1		Cohort 2		Cohort 3	
	PC	Control	PC	Control	PC	Control
Pretest $\bar{\chi}$	8.00	8.26	7.76	7.67	7.58	7.59
Pretest SD	2.85	2.67	3.02	2.96	3.01	2.78
Posttest $\bar{\chi}$	8.54	7.80	8.23	7.90	8.01	7.61
Posttest SD	2.68	2.88	2.96	2.61	2.92	2.96
$\bar{\chi}$ Difference	.53	-.45	.47	.23	.43	.02
Sign. Difference	.00	.00	.00	.06	.00	NS
Percentage Change	7%	-6%	6%	3%	6%	<1%
Effect Size	.19	-.14	.15	.07	.13	.01
Improvement Index	+8	-6	+6	+3	+5	0
Pre/Post Correlation	.50	.41	.46	.41	.38	.24
Sign. Correlation	.00	.00	.00	.00	.00	.00
n	312	338	373	412	439	353

The ANCOVA analysis produced the adjusted mean posttest scores for the PC and control group students. PC middle school students' adjusted mean posttest scores were significantly higher than those of the control group in cohort 1. The effect size of .31 corresponded with an improvement index score of +12 percentile points. The adjusted mean difference between the PC and control groups approached statistical significance in cohort 2. It was not significant in cohort 3. (See Appendix B, Table B26.)

PC high school students' belief in their ability to use STEM skills to deal with community problems increased significantly due to their participation in the program. (See Table 57.) Positive, statistically significant changes in their mean scores from pretest to posttest were found across all cohorts. The mean differences were .61, .69, and .44. The effect sizes (Hedge's *g*) were modest at .22, .25, and .14, and corresponded to improvement index scores of +9, +10, and +6 percentile points. The pretest/posttest increases for the control group were smaller than for the PC group. In cohort 1, the difference was minimal and nonsignificant. The effect sizes in cohorts 2 and 3 were very small at .08 and .10.

**Table 57**  
**High School Students STEM Index by Condition**  
**Difference of Means**

	Cohort 1		Cohort 2		Cohort 3	
	PC	Control	PC	Control	PC	Control
Pretest $\bar{x}$	7.44	7.63	7.67	7.56	7.46	7.42
Pretest SD	2.74	2.91	2.71	2.63	2.93	2.56
Posttest $\bar{x}$	8.06	7.67	8.36	7.82	7.91	7.76
Posttest SD	2.71	2.92	2.56	2.81	2.73	2.81
$\bar{x}$ Difference	.61	.04	.69	.26	.44	.34
Sign. Difference	.00	NS	.00	.06	.00	.03
Percentage Change	8%	<1%	9%	3%	6%	4%
Effect Size	.22	.01	.25	.08	.14	.10
Improvement Index	+9	0	+10	+3	+6	+4
Pre/Post Correlation	.47	.53	.44	.41	.35	.24
Sign. Correlation	.00	.00	.00	.00	.00	.00
n	627	289	480	315	497	331

The results of the ANCOVA analysis revealed that the differences in the adjusted posttest scores between PC and control group students were statistically significant in cohorts 1 and 2, but not in cohort 3. The adjusted mean difference was .48 in cohort 1, with an effect size of .17 and improvement index of +7 percentile points. In cohort 2, the adjusted difference of group means was .57, with an effect size of .21 and improvement index of +8 percentile points. (See Appendix B, Table B27.)

PC students' perceptions that their knowledge of math and science helps them to understand policy issues increased significantly after experiencing the curriculum. (See Table 58.) Middle school students' average scores on this indicator increased between 5% and 6% across all cohorts. The effect size (Hedges' *g*) was .13 in cohort 1, .14 in cohort 2, and .11 in

cohort 3, corresponding to improvement index scores of +5, +6, and +4 percentile points. The pretest/posttest mean differences for the control group were nonsignificant.

**Table 58**  
**STEM Knowledge and Understanding Policy Issues by Condition**  
**Difference of Means**  
**Middle School**

	Cohort 1		Cohort 2		Cohort 3	
	PD	Control	PD	Control	PD	Control
Pretest $\bar{x}$	3.15	3.11	3.15	3.00	3.00	2.90
Pretest SD	1.06	1.05	1.11	1.14	1.09	1.09
Posttest $\bar{x}$	3.33	3.12	3.34	3.06	3.14	2.86
Posttest SD	1.06	1.08	1.10	1.07	1.09	1.12
$\bar{x}$ Difference	.18	.01	.19	.06	.14	-.04
Sign. Difference	.02	NS	.00	NS	.00	NS
Percentage Change	6%	0	6%	2%	5%	1%
Effect Size	.13	.01	.14	.05	.11	-.03
Improvement Index	+5	0	+6	+2	+4	-1
Pre/Post Correlation	.48	.33	.30	.38	.36	.31
Sign. Correlation	.00	.00	.00	.00	.00	.00
n	309	345	341	422	498	361



The trends were similar at the high school level (See Table 59.). The pretest/posttest mean differences were positive and statistically significant for the PC students across all cohorts. The cohort 1 control group mean difference was not statistically significant. In cohort 2, there were statistically significant increases in STEM knowledge and understanding policy issues for both the PD and control groups. However, the pretest/posttest increase in average scores was greater for the PC high school group than the control group. The findings were similar for the PC and control group students in cohort 3.

**Table 59**  
**STEM Knowledge and Understanding Policy Issues by Condition**  
**Difference of Means**  
**High School**

	Cohort 1		Cohort 2		Cohort 3	
	PC	Control	PC	Control	PC	Control
Pretest $\bar{x}$	3.15	3.14	3.06	3.05	3.09	2.96
Pretest SD	1.03	1.14	1.01	.97	1.03	.99
Posttest $\bar{x}$	3.31	3.16	3.24	3.15	3.22	3.08
Posttest SD	1.05	1.09	1.05	1.06	.98	1.10
$\bar{x}$ Difference	.16	.02	.17	.10	.13	.12
Sign. Difference	.00	NS	.00	.05	.00	.05
Percentage Change	5%	<1%	6%	3%	4%	4%
Effect Size	.14	.02	.16	.09	.11	.09
Improvement Index	+6	+1	+6	+3	+4	+3
Pre/Post Correlation	.49	.48	.47	.44	.38	.24
Sign. Correlation	.00	.00	.00	.00	.00	.00
n	637	291	438	319	533	339

Students were asked if they used their math and science skills in their social studies and history classes. (See Table 60.) Middle school PC students were more inclined to answer that they used STEM skills in civics classes on the posttest. The increase in the mean scores of middle school students indicating agreement with this statement was .13 in cohort 1, .19 in cohort 2, and .16 in cohort 3. The effect sizes (Hedge's *g*) were .08, .15, and .12, corresponding to improvement index scores of +3, +6, and +5 percentile points. The findings for the control group were negative in cohort 1 and cohort 3. The PD and control group trends for middle school students were similar in cohort 2.

**Table 60**  
**STEM in Civics Class by Condition**  
**Difference of Means**  
**Middle School**

	Cohort 1		Cohort 2		Cohort 3	
	PD	Control	PD	Control	PD	Control
Pretest $\bar{x}$	3.44	3.48	3.40	3.22	3.26	3.15
Pretest SD	1.06	1.13	1.16	1.19	1.14	1.11
Posttest $\bar{x}$	3.57	3.37	3.59	3.41	3.42	3.11
Posttest SD	1.07	1.18	1.12	1.05	1.19	1.18
$\bar{x}$ Difference	.13	-.12	.19	.18	.16	-.04
Sign. Difference	.05	.05	.00	.00	.00	NS
Percentage Change	4%	-3%	6%	6%	5%	-1%
Effect Size	.08	-.08	.15	.14	.12	-.02
Improvement Index	+3	-3	+6	+5	+5	-1
Pre/Post Correlation	.34	.33	.34	.33	.33	.15
Sign. Correlation	.00	.00	.00	.00	.00	.00
n	308	345	341	422	498	316

The trends for high school students were similar to the middle school findings. (See Table 61.) The pretest/posttest difference of means were .20, .21, and .14. The percentage change was between 5% and 6%. The effect sizes were .16, .16, and .11 which corresponded to improvement index scores of +3, +6, and +5 percentile points. The difference of pretest/posttest means was greater for the PC group than the control group in cohorts 1 and 2, and the same in cohort 3.

**Table 61**  
**STEM in Civics Class by Condition**  
**Difference of Means**  
**High School**

	Cohort 1		Cohort 2		Cohort 3	
	PC	Control	PC	Control	PC	Control
Pretest $\bar{x}$	3.20	3.22	3.27	3.11	3.09	3.02
Pretest SD	1.08	1.22	1.06	1.15	1.15	1.05
Posttest $\bar{x}$	3.40	3.31	3.48	3.24	3.23	3.16
Posttest SD	1.10	1.16	1.01	1.13	1.11	1.09
$\bar{x}$ Difference	.20	.09	.21	.13	.14	.14
Sign. Difference	.00	NS	.00	.04	.01	.02
Percentage Change	6%	3%	6%	4%	5%	5%
Effect Size	.16	.07	.16	.10	.11	.11
Improvement Index	+6	+3	+6	+4	+4	+4
Pre/Post Correlation	.40	.45	.33	.36	.35	.34
Sign. Correlation	.00	.00	.00	.00	.00	.00
n	637	291	438	319	533	533

## SUMMARY

The Project Citizen Research Program evaluated the effectiveness of the Center for Civic Education's Project Citizen professional development program and curriculum intervention on middle and high school students' civic outcomes. The research studied the impact of the program on teachers' knowledge and understanding of the public policy process and civic engagement, their adoption of active pedagogies conducive to project-based learning, their ability to convey SEL competencies to students, and their integration of STEM into the civics curriculum. It explored students' acquisition of civic knowledge, civic dispositions, civic skills, civics-related SEL competencies, and STEM skills.

The initial intention was to field the study during three typical school years. The COVID-19 pandemic upended those plans. After consultation with our program officer at the Institute of Education Sciences, the Center and CERL made the decision to go ahead with the implementation of the PC program and to conduct the research. The Center quickly adapted the PC teacher PD program for a virtual format. Center staff worked with state coordinators and mentor teachers to develop curriculum innovations that would enable teachers the flexibility to teach Project Citizen under uncertain conditions that were continually in flux. The research had the added dimension of evaluating the program's effectiveness for three years that were heavily impacted by the pandemic. Each cohort of the study experienced a different set of circumstances related to the mode in which the PD and curriculum were delivered, the impact of the pandemic on teachers' and students' wellbeing, and wider societal conditions.

Teachers faced logistical challenges that went well beyond what they encounter in a typical academic year. Having to pivot between virtual, hybrid, and in-person instruction introduced a novel level of difficulty in implementing the curriculum. Teachers became resourceful innovators. Classroom management, especially getting students to work collaboratively and cooperatively in a virtual or hybrid environment, was a struggle. While PC is designed to have an entire class work on the same community or school problem, some teachers created groups that worked on different issues based on whether they were attending class from home or in school. This option added to the teachers' workload but was more effective in conveying the curriculum. Problems with technology, especially in classes with under-served student populations, hindered access to online resources, including the digital PC textbook. More teachers and students than usual reported that stakeholders and political leaders they contacted were not responsive. Some officials claimed that they were occupied with the pandemic and did not have time to meet with students. While students were disappointed, they gained a realistic civic learning experience. Teachers discussed the difficulties they had keeping students engaged as they worked on the project, and that the labor on the project often was not evenly distributed. Other teachers found that students were more motivated to learn through PC, especially when they were interested in the problem that the class was addressing. They felt that the active learning elements kept students' attention more than lecture and textbook based learning that was frequently the default during the pandemic.

The findings of this study offer encouraging evidence that PC was effective in producing positive outcomes for teachers and students under challenging and demanding circumstances. Teachers enhanced their knowledge of American government and the policy making process.

They adapted active learning pedagogies to virtual and hybrid instructional environments. Their self-efficacy improved as they felt better prepared to promote students' civic learning, self-care, self-management, relationship skills, and respectful classroom discourse. They also were able to successfully convey SEL and STEM skills to their students.

PC students' gains in civic knowledge were consistent with the outcomes of prior research. Large improvements in knowledge were observed for both middle and high school students. The knowledge increases were significantly greater for the PC students than their counterparts in the control group. Conveying civic dispositions and skills through classroom civics is notoriously difficult (Jamieson, 2013; Owen and Irion-Groth, 2022). The study found that PC students' sense of civic responsibility increased along with their belief that they could effectively take part in civic life. Students gained confidence in performing the civic tasks that are integral to the PC curriculum, including monitoring government and politics, paying attention to societal issues, and working with others to solve a problem in their community. They were more inclined to consider voting to be an important civic responsibility and to express a strong intention to turn out in elections if given the opportunity in the future. High school students were more likely to consider government service and possibly running for public office one day after participating in PC. The gains in civic dispositions and skills, while modest in some instances, would be noteworthy even without the complications of the pandemic. PC students also acquired civics-related SEL competencies, including problem solving and civic expression skills. They were much more likely to use STEM skills in their classes than control group students.

There is much more to be learned about the impact of the pandemic on secondary school civic learning. A trend was observed in the present study points to potential long-term effects. In Year 3 (2022-23), classroom instruction had returned to "normal" with most schools holding classes in-person. However, the effects of the pandemic were becoming apparent. Teachers' self-efficacy was diminished for this cohort and declined over the academic year. Students who had experienced disruptions in classroom learning for two years came to Project Citizen and their traditional civics classes with substantially lower baseline scores on civic knowledge than students in prior years. In some instances, the magnitude of the improvement in the civic orientations was notably smaller than for other cohorts. The pandemic's impact on civic learning is likely to be felt well into the foreseeable future.

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## **APPENDIX A**

### **SAMPLE ATTRITION**

## Sample Attrition for Schools, Teachers, and Students

Sample attrition was documented for schools, teachers, and students. “Stayers” and “leavers” were identified for the school and teacher samples. No school or teacher joined the study after it commenced, so no “joiners” were identified. “Stayers,” “leavers,” and “joiners” were tracked for the student sample by comparing class lists with study participants at points in the study when data were collected.

Steps were taken to minimize attrition among both teachers and students to the extent possible. An informational letter was sent to principals and administrators to foster understanding of the program and cooperation. Participating schools were provided access to the research results that were produced from the study. Teachers from schools in both the intervention and control groups were offered monetary incentives for their participation. The monetary incentives were increased for the control group teachers to in an effort to offset the pandemic’s effect on sustained participation in the study. Control group teachers were given the opportunity to receive the Project Citizen professional development with a subsequent cohort. Program coordinators and mentor teachers maintained regular contact with the teachers in the intervention group and identified issues that might cause a school or teacher to drop out. The CERL team established sustained contact with program coordinators and teachers participating in the study, providing detailed instruction for administering the student tests and following up with reminders.

Given that the study was conducted during pandemic conditions and the possibility for attrition was enhanced, a total of 70 schools were recruited for the study in each program year for a total of 210 schools. This number is higher than originally planned. Of the 70 schools in each cohort, 35 were randomly assigned to the PC group and 35 to the control group which did not receive the intervention. In cohort 1, overall school attrition was 19% and differential attrition was 9%. In cohort 2, overall attrition was 16% and differential attrition was 9%. In cohort 3, overall attrition was 9% and differential attrition was 5%. The school samples in cohorts 1 and 2 met the What Works Clearinghouse (WWC) liberal attrition standard.<sup>5</sup> The cohort 3 school sample met WWC’s conservative attrition standard. (See Table A1.)

**Table A1**  
**School Attrition**

	<b>Total Schools</b>	<b>Stayers</b>	<b>Leavers</b>	<b>Overall Attrition</b>
Cohort 1	70	57	13	19%
Cohort 2	70	59	11	16%
Cohort 2	70	64	6	9%

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<sup>5</sup> What Works Clearinghouse. “WWC Standards Brief: Attrition Standard,” Institute of Education Sciences. [WWC STANDARDS Brief: Attrition Standard \(ed.gov\)](#)

	<b>Total Schools</b>	<b>Stayers</b>	<b>Leavers</b>	<b>% Attrition</b>	<b>Differential Attrition</b>
<b>Cohort 1</b>					
Project Citizen	35	30	5	14%	9%
Control	35	27	8	23%	
<b>Cohort 2</b>					
Project Citizen	35	31	4	11%	9%
Control	35	28	7	20%	
<b>Cohort 3</b>					
Project Citizen	35	33	2	6%	5%
Control	35	31	4	11%	

All qualified teachers instructing civics, social studies, or American government courses were invited to participate in the study. While in most instances one teacher from a school enrolled in the study, there were schools in each cohort where two or three teachers enrolled. In cohort 1, a total of 77 teachers enrolled in the study—63 stayers and 14 leavers. The overall attrition was 18% and the differential attrition was 9%. A total of 78 teachers enrolled in the cohort 2 study, with 61 stayers and 16 leavers. The overall attrition was 23% and the differential attrition was 2%. In cohort 3, 82 total teachers enrolled, with 72 stayers and 10 leavers. The total attrition was 12% and the differential attrition was 6%. The teacher sample in cohort 1 met the WWC’s liberal attrition standard. The samples in cohorts 2 and 3 met the conservative standard. (See Table A2.)

**Table A2  
Teacher Attrition**

	<b>Total Teachers</b>	<b>Stayers</b>	<b>Leavers</b>	<b>Overall Attrition</b>
Cohort 1	77	63	14	18%
Cohort 2	78	61	18	23%
Cohort 2	82	72	10	12%

	<b>Total Teachers</b>	<b>Stayers</b>	<b>Leavers</b>	<b>% Attrition</b>	<b>Differential Attrition</b>
<b>Cohort 1</b>					
Project Citizen	42	36	6	14%	9%
Control	35	27	8	23%	
<b>Cohort 2</b>					
Project Citizen	43	34	9	21%	2%
Control	35	27	8	23%	
<b>Cohort 3</b>					
Project Citizen	43	39	4	9%	6%
Control	39	33	6	15%	

All students of teachers enrolled in the study were eligible to participate. Joiners were not eligible to participate in the study. Over the three study years, a total of 6,521 students enrolled in the study and 5,415 stayed. The overall attrition for the combined number of students in all cohorts was 17%. A total of 1,755 students were enrolled in cohort 1, 733 middle school and 982 high school students. In cohort 1, 895 middle school students enrolled, 733 were stayers, 162 were leavers, and the overall attrition rate was 18%. In cohort 2, 1,093 middle school students were enrolled in the study, 856 stayed, 237 left, and the overall attrition was 28%. In cohort 3, a total of 1,200 middle school students were enrolled of which 1,001 were stayers, 199 were leavers, and the overall attrition was 17%. The differential attrition between the Project Citizen and control group for middle school students was 5% in cohort 1, 3% in cohort 2, and 5% in cohort 3. The middle school samples in all three cohorts met WWC’s conservative attrition standard. (See Table A3.) The total number of high school students enrolled in cohort 1 was 1,191, of which 982 were stayers and 209 were leavers. Overall attrition was 18%. In cohort 2, a total of 1,095 students were enrolled in the study, 863 were stayers, 232 were leavers, and the overall attrition was 21%. In cohort 3, 1,107 total students were enrolled, 940 were stayers, 167 were leavers, and the overall attrition was 15%. The differential attrition between the Project Citizen and control group was 5% in cohort 1, 3% in cohort 2, and 5% in cohort 3. The samples in all three high school student cohorts met WWC’s conservative attrition standard. (See Table A4.)

**Table A3  
Middle School Student Attrition**

	<b>Total Students</b>	<b>Stayers</b>	<b>Leavers</b>	<b>Overall Attrition</b>
Cohort 1	895	733	162	18%
Cohort 2	1,093	856	237	28%
Cohort 2	1,200	1,001	199	17%

	<b>Total Students</b>	<b>Stayers</b>	<b>Leavers</b>	<b>Joiners</b>	<b>% Attrition</b>	<b>Differential Attrition</b>
<b>Cohort 1</b>						
Project Citizen	435	346	89	16	21%	5%
Control	460	387	73	21	16%	
<b>Cohort 2</b>						
Project Citizen	466	375	91	11	20%	3%
Control	627	481	146	32	23%	
<b>Cohort 3</b>						
Project Citizen	661	558	103	24		2%
Control	539	443	96	27	18%	

**Table A4  
High School Student Attrition**

	<b>Total Students</b>	<b>Stayers</b>	<b>Leavers</b>	<b>Overall Attrition</b>
Cohort 1	1,191	982	209	18%
Cohort 2	1,095	863	232	21%
Cohort 2	1,107	940	167	15%

	<b>Total Students</b>	<b>Stayers</b>	<b>Leavers</b>	<b>Joiners</b>	<b>% Attrition</b>	<b>Differential Attrition</b>
<b>Cohort 1</b>						
Project Citizen	773	650	123	13	16%	5%
Control	418	332	86	26	21%	
<b>Cohort 2</b>						
Project Citizen	622	483	139	26	23%	3%
Control	473	380	93	39	20%	
<b>Cohort 3</b>						
Project Citizen	654	568	86	21	13%	5%
Control	453	372	81	33	18%	

## **APPENDIX B**

### **ANCOVA TABLES**



**Table B1**  
**ANCOVA Analysis of Teachers' Knowledge**

<b>Cohort 1</b>							
	Pretest		Posttest (Unadjusted)		Posttest (Adjusted)		n
	Mean	SE Mean	Mean	SE Mean	Mean	SE Mean	
PC	27.71	1.00	29.93	.77	29.95	.54	36
Control	27.57	1.27	27.86	1.28	27.98	.84	27
Adj. $\bar{\chi}$ Group Diff.	SE Difference		Sig. Difference		Effect Size		Improvement Index
1.97	.96		.04		.33		+13
Source	SS		df	Mean Square	F	Sig.	Partial $\eta^2$
PC/Control	47.131		1	47.131	3.25	.04	.05
Pretest Knowledge	1446.73		1	1446.73	93.34	.00	.57
<b>Cohort 2</b>							
	Pretest		Posttest (Unadjusted)		Posttest (Adjusted)		n
	Mean	SE Mean	Mean	SE Mean	Mean	SE Mean	
PC	26.47	1.43	30.41	1.11	31.56	.58	34
Control	28.92	1.13	30.00	1.05	29.06	.65	27
Adj. $\bar{\chi}$ Group Diff.	SE Difference		Sig. Difference		Effect Size		Improvement Index
2.09	.88		.02		.41		+16
Source	SS		df	Mean Square	F	Sig.	Partial $\eta^2$
PC/Control	64.01		1	64.01	5.57	.02	.69
Pretest Knowledge	1509.48		1	1509.48	131.41	.00	.09
<b>Cohort 3</b>							
	Pretest		Posttest (Unadjusted)		Posttest (Adjusted)		n
	Mean	SE Mean	Mean	SE Mean	Mean	SE Mean	
PC	25.02	1.25	30.21	.88	30.48	.81	39
Control	25.63	1.39	24.79	9.81	24.67	.88	33
Adj. $\bar{\chi}$ Group Diff.	SE Difference		Sig. Difference		Effect Size		Improvement Index
5.81	1.20		.00		.80		+29
Source	SS		df	Mean Square	F	Sig.	Partial $\eta^2$
PC/Control	601.65		1	601.65	23.17	.00	.25
Pretest Knowledge	25588.65		1	25588.65	99.69	.00	.59

**Table B2**  
**ANCOVA Analysis of Civic Knowledge Objectives Index**

<b>Cohort 1</b>							
	Pretest		Posttest (Unadjusted)		Posttest (Adjusted)		n
	Mean	SE Mean	Mean	SE Mean	Mean	SE Mean	
PC	14.14	.36	14.28	.34	14.24	.26	36
Control	14.33	.61	14.57	.63	14.26	.40	27
Adj. $\bar{\chi}$ Group Diff.	SE Difference		Sig. Difference		Effect Size		Improvement Index
.02	.48		NS		.01		+0
Source	SS		df	Mean Square	F	Sig.	Partial $\eta^2$
PC/Control	231.44		1	231.44	.00	NS	.00
Pretest Knowledge	.01		1	.01	65.54	.00	.49
<b>Cohort 2</b>							
	Pretest		Posttest (Unadjusted)		Posttest (Adjusted)		n
	Mean	SE Mean	Mean	SE Mean	Mean	SE Mean	
PC	14.46	.49	14.92	.62	15.33	.43	34
Control	15.68	.38	14.77	.43	14.26	.49	27
Adj. $\bar{\chi}$ Group Diff.	SE Difference		Sig. Difference		Effect Size		Improvement Index
1.07	.66		NS		.38		+15
Source	SS		df	Mean Square	F	Sig.	Partial $\eta^2$
PC/Control	13.07		1	13.07	2.55	NS	.05
Pretest Knowledge	140.91		1	140.91	27.50	.00	.37
<b>Cohort 3</b>							
	Pretest		Posttest (Unadjusted)		Posttest (Adjusted)		n
	Mean	SE Mean	Mean	SE Mean	Mean	SE Mean	
PC	16.18	.57	16.43	.53	15.97	.48	39
Control	14.67	.82	14.42	.91	15.04	.55	33
Adj. $\bar{\chi}$ Group Diff.	SE Difference		Sig. Difference		Effect Size		Improvement Index
.93	.74		NS		.23		+9
Source	SS		df	Mean Square	F	Sig.	Partial $\eta^2$
PC/Control	13.28		1	13.28	1.55	NS	.02
Pretest Knowledge	483.96		1	483.96	56.61	.00	.22

**Table B3**  
**ANCOVA Analysis of Middle School Students' Civic Knowledge**

<b>Cohort 1</b>							
	Pretest		Posttest (Unadjusted)		Posttest (Adjusted)		n
	Mean	SE Mean	Mean	SE Mean	Mean	SE Mean	
PC	4.73	.15	6.83	.17	6.73	.14	382
Control	4.35	.14	5.79	.15	5.89	.14	390
Adj. $\bar{\chi}$ Group Diff.	SE Difference		Sig. Difference		Effect Size		Improvement Index
.84	.20		.00		.27		+10
Source	SS	df	Mean Square	F	Sig.	Partial $\eta^2$	
PC/Control	134.49	1	134.49	16.66	.00	.02	
School	1.52	1	1.52	.19	NS	.00	
Pretest Knowledge	1540.00	1	1540.00	190.76	.00	.20	
<b>Cohort 2</b>							
	Pretest		Posttest (Unadjusted)		Posttest (Adjusted)		n
	Mean	SE Mean	Mean	SE Mean	Mean	SE Mean	
PC	4.15	.14	7.37	.17	8.01	.17	375
Control	5.88	.14	6.85	.15	6.00	.19	461
Adj. $\bar{\chi}$ Group Diff.	SE Difference		Sig. Difference		Effect Size		Improvement Index
2.00	.27		.00		.63		+23
Source	SS	df	Mean Square	F	Sig.	Partial $\eta^2$	
PC/Control	387.56	1	387.56	58.82	.00	.09	
School	9.79	1	9.79	1.36	NS	.00	
Pretest Knowledge	1750.91	1	1750.91	243.15	.00	.30	
<b>Cohort 3</b>							
	Pretest		Posttest (Unadjusted)		Posttest (Adjusted)		n
	Mean	SE Mean	Mean	SE Mean	Mean	SE Mean	
PC	3.68	.11	6.11	.13	6.96	.17	552
Control	3.22	.13	4.88	.14	3.83	.19	449
Adj. $\bar{\chi}$ Group Diff.	SE Difference		Sig. Difference		Effect Size		Improvement Index
3.12	.31		.00		1.04		+35
Source	SS	df	Mean Square	F	Sig.	Partial $\eta^2$	
PC/Control	779.37	1	779.37	99.99	.00	.09	
School	484.06	1	484.06	62.10	.00	.06	
Pretest Knowledge	397.97	1	397.97	51.06	.00	.05	

**Table B4**  
**ANCOVA Analysis of High School Students' Civic Knowledge**

<b>Cohort 1</b>							
	Pretest		Posttest (Unadjusted)		Posttest (Adjusted)		n
	Mean	SE Mean	Mean	SE Mean	Mean	SE Mean	
PC	7.77	.14	9.88	.15	9.59	.11	642
Control	6.61	.17	7.75	.19	8.25	.17	340
Adj. $\bar{\chi}$ Group Diff.	SE Difference		Sig. Difference		Effect Size		Improvement Index
1.34	.21		.00		.36		+14
Source	SS	df	Mean Square	F	Sig.	Partial $\eta^2$	
PC/Control	385.83	1	385.83	42.81	.00	.04	
School	.10	1	.10	.00	NS	.00	
Pretest Knowledge	4987.33	1	4987.33	553.42	.00	.36	
<b>Cohort 2</b>							
	Pretest		Posttest (Unadjusted)		Posttest (Adjusted)		n
	Mean	SE Mean	Mean	SE Mean	Mean	SE Mean	
PC	6.35	.14	8.39	.18	11.02	.13	462
Control	5.70	.18	7.50	.22	7.58	.28	365
Adj. $\bar{\chi}$ Group Diff.	SE Difference		Sig. Difference		Effect Size		Improvement Index
3.44	.33		.00		1.04		+35
Source	SS	df	Mean Square	F	Sig.	Partial $\eta^2$	
PC/Control	688.73	1	688.73	103.24	.00	.15	
School	71.90	1	71.90	10.77	.00	.02	
Pretest Knowledge	3007.23	1	3007.23	450.78	.00	.43	
<b>Cohort 3</b>							
	Pretest		Posttest (Unadjusted)		Posttest (Adjusted)		n
	Mean	SE Mean	Mean	SE Mean	Mean	SE Mean	
PC	6.43	.14	8.45	.16	8.59	.19	564
Control	5.99	.16	7.73	.19	7.20	.26	376
Adj. $\bar{\chi}$ Group Diff.	SE Difference		Sig. Difference		Effect Size		Improvement Index
1.40	.40		.00		.37		+14
Source	SS	df	Mean Square	F	Sig.	Partial $\eta^2$	
PC/Control	133.11	1	133.11	12.11	.00	.01	
School	75.81	1	75.81	276.32	.00	.23	
Pretest Knowledge	3036.60	1	3036.60	6.89	.01	.01	

**Table B5**  
**ANCOVA Analysis of Middle School Students' Civic Responsibility**

<b>Cohort 1</b>							
	Pretest		Posttest (Unadjusted)		Posttest (Adjusted)		n
	Mean	SE Mean	Mean	SE Mean	Mean	SE Mean	
<b>PC</b>	1.92	.06	1.97	.06	1.94	.06	303
<b>Control</b>	2.06	.07	1.97	.06	1.96	.06	346
<b>Adj. <math>\chi</math> Group Diff.</b>	<b>SE Difference</b>		<b>Sig. Difference</b>		<b>Effect Size</b>		<b>Improvement Index</b>
	.02		NS		.02		0
<b>Source</b>	<b>SS</b>	<b>df</b>	<b>Mean Square</b>	<b>F</b>	<b>Sig.</b>	<b>Partial <math>\eta^2</math></b>	
PC/Control	.12	1	.12	.11	NS	.00	
School	.71	1	.71	.61	NS	.00	
Pretest Civic Duty	81.13	1	81.13	69.94	.00	.10	
<b>Cohort 2</b>							
	Pretest		Posttest (Unadjusted)		Posttest (Adjusted)		n
	Mean	SE Mean	Mean	SE Mean	Mean	SE Mean	
<b>PC</b>	1.99	.06	2.03	.06	2.01	.07	334
<b>Control</b>	2.02	.05	1.95	.05	2.00	.08	420
<b>Adj. <math>\chi</math> Group Diff.</b>	<b>SE Difference</b>		<b>Sig. Difference</b>		<b>Effect Size</b>		<b>Improvement Index</b>
	.01		NS		.01		0
<b>Source</b>	<b>SS</b>	<b>df</b>	<b>Mean Square</b>	<b>F</b>	<b>Sig.</b>	<b>Partial <math>\eta^2</math></b>	
PC/Control	1.29	1	1.29	1.04	NS	.00	
School	.89	1	.89	.78	NS	.00	
Pretest Civic Duty	117.23	1	117.23	94.52	.00	.11	
<b>Cohort 3</b>							
	Pretest		Posttest (Unadjusted)		Posttest (Adjusted)		n
	Mean	SE Mean	Mean	SE Mean	Mean	SE Mean	
<b>PC</b>	1.92	.05	1.98	.05	1.96	.07	471
<b>Control</b>	1.85	.05	1.94	.05	1.97	.08	344
<b>Adj. <math>\chi</math> Group Diff.</b>	<b>SE Difference</b>		<b>Sig. Difference</b>		<b>Effect Size</b>		<b>Improvement Index</b>
	.01		NS		.01		0
<b>Source</b>	<b>SS</b>	<b>df</b>	<b>Mean Square</b>	<b>F</b>	<b>Sig.</b>	<b>Partial <math>\eta^2</math></b>	
PC/Control	.01	1	.01	.01	NS	.00	
School	.06	1	.06	.04	NS	.00	
Pretest Civic Duty	83.26	1	83.26	70.62	.00	.08	

**Table B6**  
**ANCOVA Analysis of High School Students' Civic Responsibility**

<b>Cohort 1</b>							
	Pretest		Posttest (Unadjusted)		Posttest (Adjusted)		n
	Mean	SE Mean	Mean	SE Mean	Mean	SE Mean	
PC	2.09	.05	2.18	.05	2.19	.04	639
Control	2.15	.04	2.14	.04	2.12	.07	293
Adj. $\chi$ Group Diff.	SE Difference	Sig. Difference	Percentage Difference	Effect Size	Improvement Index		
.07	.08	NS	3%	.06			
Source	SS	df	Mean Square	F	Sig.	Partial $\eta^2$	
PC/Control	.87	1	.87	.69	NS	.00	
School	.90	1	.90	.67	NS	.00	
Pretest Civic Duty	300.62	1	300.62	232.27	.00	.20	
<b>Cohort 2</b>							
	Pretest		Posttest (Unadjusted)		Posttest (Adjusted)		n
	Mean	SE Mean	Mean	SE Mean	Mean	SE Mean	
PC	1.86	.05	2.06	.05	2.06	.05	426
Control	1.97	.06	2.10	.07	2.07	.12	312
Adj. $\chi$ Group Diff.	SE Difference	Sig. Difference	Percentage Difference	Effect Size	Improvement Index		
.02	.15	NS	.49%	.01	0		
Source	SS	df	Mean Square	F	Sig.	Partial $\eta^2$	
PC/Control	.021	1	.021	.274	NS	.00	
School	.33	1	.33	.02	NS	.00	
Pretest Civic Duty	132.74	1	132.74	108.97	.00	.17	
<b>Cohort 3</b>							
	Pretest		Posttest (Unadjusted)		Posttest (Adjusted)		n
	Mean	SE Mean	Mean	SE Mean	Mean	SE Mean	
PC	1.77	.06	2.07	.07	2.05	.07	523
Control	1.80	.04	2.05	.05	2.06	.06	328
Adj. $\chi$ Group Diff.	SE Difference	Sig. Difference	Percentage Difference	Effect Size	Improvement Index		
<.01	.14	NS	.49%	.01	0		
Source	SS	df	Mean Square	F	Sig.	Partial $\eta^2$	
PC/Control	.01	1	.01	.00	NS	.00	
School	.14	1	.14	.11	NS	.00	

**Table B7**  
**ANCOVA Analysis of Middle School Students' Attention to Issues**

<b>Cohort 1</b>							
	Pretest		Posttest (Unadjusted)		Posttest (Adjusted)		n
	Mean	SE Mean	Mean	SE Mean	Mean	SE Mean	
PC	3.33	.06	3.19	.06	3.33	.06	341
Control	3.24	.06	2.95	.06	2.98	.06	353
Adj. $\bar{x}$ Group Diff.	SE Difference		Sig. Difference		Effect Size		Improvement Index
.35	.18		.00		.32		+13
Source	SS	df	Mean Square	F	Sig.	Partial $\eta^2$	
PC/Control	5.25	1	5.25	5.22	.00	.04	
School	3.24	1	3.24	2.97	NS	.00	
Pretest Attention	166.08	1	166.08	152.12	.00	.18	
<b>Cohort 2</b>							
	Pretest		Posttest (Unadjusted)		Posttest (Adjusted)		n
	Mean	SE Mean	Mean	SE Mean	Mean	SE Mean	
PC	3.17	.06	3.13	.06	3.14	.06	357
Control	3.26	.06	3.06	.06	3.04	.07	447
Adj. $\bar{x}$ Group Diff.	SE Difference		Sig. Difference		Effect Size		Improvement Index
.10	.11		NS		.08		+3
Source	SS	df	Mean Square	F	Sig.	Partial $\eta^2$	
PC/Control	1.03	1	1.03	.89	NS	.00	
School	.98	1	.98	.08	NS	.00	
Pretest Attention	94.64	1	94.64	81.67	.00	.17	
<b>Cohort 3</b>							
	Pretest		Posttest (Unadjusted)		Posttest (Adjusted)		n
	Mean	SE Mean	Mean	SE Mean	Mean	SE Mean	
PC	2.98	.05	3.08	.05	3.09	.06	518
Control	3.12	.05	2.93	.05	3.04	.08	393
Adj. $\bar{x}$ Group Diff.	SE Difference		Sig. Difference		Effect Size		Improvement Index
.04	.13		NS		.03+1		
Source	SS	df	Mean Square	F	Sig.	Partial $\eta^2$	
PC/Control	1.75	1	1.75	1.75	NS	.00	
School	4.63	1	4.63	4.01	.05	.00	
Pretest Attention	75.56	1	75.56	66.13	.00	.06	

**Table B8**  
**ANCOVA Analysis of High School Students' Attention to Issues**

<b>Cohort 1</b>							
	Pretest		Posttest (Unadjusted)		Posttest (Adjusted)		n
	Mean	SE Mean	Mean	SE Mean	Mean	SE Mean	
PC	3.32	.05	3.23	.05	3.24	.04	648
Control	3.37	.06	3.10	.06	3.09	.06	306
Adj. $\bar{x}$ Group Diff.	SE Difference		Sig. Difference		Effect Size		Improvement Index
.14	.07		.05		.12		+5
Source	SS	df	Mean Square	F	Sig.	Partial $\eta^2$	
PC/Control	4.18	1	4.18	3.76	.05	.00	
School	.00	1	.00	.00	NS	.00	
Pretest Attention	277.11	1	277.11	249.25	.00	.20	
<b>Cohort 2</b>							
	Pretest		Posttest (Unadjusted)		Posttest (Adjusted)		n
	Mean	SE Mean	Mean	SE Mean	Mean	SE Mean	
PC	3.10	.06	3.15	.06	3.14	.05	450
Control	3.25	.06	3.18	.06	3.17	.11	335
Adj. $\bar{x}$ Group Diff.	SE Difference		Sig. Difference		Effect Size		Improvement Index
.03	.13		NS		.02		0
Source	SS	df	Mean Square	F	Sig.	Partial $\eta^2$	
PC/Control	.07	1	.07	.07	NS	.00	
School	.23	1	.23	.21	NS	.00	
Pretest Attention	141.59	1	141.59	129.45	.00	.18	
<b>Cohort 3</b>							
	Pretest		Posttest (Unadjusted)		Posttest (Adjusted)		n
	Mean	SE Mean	Mean	SE Mean	Mean	SE Mean	
PC	3.01	.04	2.90	.05	3.02	.06	542
Control	2.90	.06	2.98	.06	3.04	.06	346
Adj. $\bar{x}$ Group Diff.	SE Difference		Sig. Difference		Effect Size		Improvement Index
.02	.13		NS		.01		0
Source	SS	df	Mean Square	F	Sig.	Partial $\eta^2$	
PC/Control	1.93	1	1.93	1.68	NS	.00	
School	.29	1	.29	.25	NS	.00	
Pretest Attention	128.21	1	128.21	111.48	.00	.11	



**Table B9**  
**ANCOVA Analysis of Middle School Students' Duty to Vote**

<b>Cohort 1</b>							
	Pretest		Posttest (Unadjusted)		Posttest (Adjusted)		n
	Mean	SE Mean	Mean	SE Mean	Mean	SE Mean	
PC	1.97	.04	2.17	.04	2.17	.04	308
Control	1.98	.04	2.02	.04	2.02	.04	348
Adj. $\bar{x}$ Group Diff.	SE Difference		Sig. Difference		Effect Size		Improvement Index
.15	.05		.01		.19		+8
Source	SS	df	Mean Square	F	Sig.	Partial $\eta^2$	
PC/Control	3.51	1	3.51	7.07	.01	.01	
School	.199	1	.199	.402	NS	.00	
Pretest Duty to Vote	71.56	1	71.56	144.38	.00	.18	
<b>Cohort 2</b>							
	Pretest		Posttest (Unadjusted)		Posttest (Adjusted)		n
	Mean	SE Mean	Mean	SE Mean	Mean	SE Mean	
PC	1.93	.04	2.05	.04	2.06	.04	349
Control	1.98	.04	2.02	.04	2.01	.05	431
Adj. $\bar{x}$ Group Diff.	SE Difference		Sig. Difference		Effect Size		Improvement Index
.05	.07		NS		.06		+2
Source	SS	df	Mean Square	F	Sig.	Partial $\eta^2$	
PC/Control	.200	1	.200	.374	NS	.00	
School	.046	1	.046	.085	NS	.00	
Pretest Duty to Vote	53.33	1	53.33	56.33	.00	.16	
<b>Cohort 3</b>							
	Pretest		Posttest (Unadjusted)		Posttest (Adjusted)		n
	Mean	SE Mean	Mean	SE Mean	Mean	SE Mean	
PC	1.73	.03	1.91	.03	1.87	.05	502
Control	1.72	.03	1.76	.04	1.83	.05	374
Adj. $\bar{x}$ Group Diff.	SE Difference		Sig. Difference		Effect Size		Improvement Index
.04	.03		NS		.00		.00
Source	SS	df	Mean Square	F	Sig.	Partial $\eta^2$	
PC/Control	.09	1	.09	.171	NS	.00	
School	1.10	1	1.10	2.04	NS	.00	
Pretest Duty to Vote	25.24	1	25.24	46.48	.00	.05	

**Table B10**  
**ANCOVA Analysis of High School Students' Duty to Vote**

<b>Cohort 1</b>							
	Pretest		Posttest (Unadjusted)		Posttest (Adjusted)		n
	Mean	SE Mean	Mean	SE Mean	Mean	SE Mean	
PC	2.27	.03	2.27	.04	2.34	.03	641
Control	2.34	.03	2.22	.04	2.22	.04	294
Adj. $\bar{\chi}$ Group Diff.	SE Difference		Sig. Difference		Effect Size		Improvement Index
.112	.04		.01		.15		+6
Source	SS	df	Mean Square	F	Sig.	Partial $\eta^2$	
PC/Control	3.05	1	3.05	6.48	.01	.01	
School	.19	1	.19	.42	NS	.00	
Pretest Duty to Vote	99.50	1	99.50	211.20	.00	.19	
<b>Cohort 2</b>							
	Pretest		Posttest (Unadjusted)		Posttest (Adjusted)		n
	Mean	SE Mean	Mean	SE Mean	Mean	SE Mean	
PC	2.09	.04	2.15	.04	2.14	.03	441
Control	2.11	.04	2.11	.04	1.97	.07	322
Adj. $\bar{\chi}$ Group Diff.	SE Difference		Sig. Difference		Effect Size		Improvement Index
.17	.09		.06		.22		+9
Source	SS	df	Mean Square	F	Sig.	Partial $\eta^2$	
PC/Control	1.66	1	1.66	3.56	.06	.01	
School	.57	1	.57	1.22	NS	.00	
Pretest Duty to Vote	65.64	1	65.64	140.64	.00	.20	
<b>Cohort 3</b>							
	Pretest		Posttest (Unadjusted)		Posttest (Adjusted)		n
	Mean	SE Mean	Mean	SE Mean	Mean	SE Mean	
PC	2.06	.03	2.15	.03	2.15	.04	537
Control	1.93	.04	2.04	.04	2.02	.06	343
Adj. $\bar{\chi}$ Group Diff.	SE Difference		Sig. Difference		Effect Size		Improvement Index
.13	.09		NS		.25		+10
Source	SS	df	Mean Square	F	Sig.	Partial $\eta^2$	
PC/Control	1.11	1	1.11	2.05	NS	.00	
School	.456	1	.456	.457	NS	.00	
Pretest Duty to Vote	69.03	1	69.03	69.03	.00	.13	

**Table B11**  
**ANCOVA Analysis of Middle School Students' Future Government Service**

<b>Cohort 1</b>							
	Pretest		Posttest (Unadjusted)		Posttest (Adjusted)		n
	Mean	SE Mean	Mean	SE Mean	Mean	SE Mean	
PC	3.35	.12	3.35	.12	3.34	.12	321
Control	3.33	.11	3.30	.11	3.30	.11	343
Adj. $\bar{\chi}$ Difference	SE Difference		Sig. Difference		Effect Size		Improvement Index
.04	.14		NS		.01		0
Source	SS	df	Mean Square	F	Sig.	Partial $\eta^2$	
PC/Control	.18	1	.18	.05	NS	.00	
School	.94	1	.94	.28	NS	.00	
Pretest Govt. Service	542.37	1	542.37	162.11	.00	.21	
<b>Cohort 2</b>							
	Pretest		Posttest (Unadjusted)		Posttest (Adjusted)		n
	Mean	SE Mean	Mean	SE Mean	Mean	SE Mean	
PC	3.70	.10	4.02	.09	4.06	.11	338
Control	3.65	.10	3.65	.11	3.63	.09	424
Adj. $\bar{\chi}$ Difference	SE Difference		Sig. Difference		Effect Size		Improvement Index
.42	.14		.00		.20		+8
Source	SS	df	Mean Square	F	Sig.	Partial $\eta^2$	
PC/Control	30.06	1	30.06	8.57	.00	.01	
School	15.77	1	15.77	4.49	.03	.01	
Pretest Govt. Service	713.39	1	713.39	203.29	.00	.22	
<b>Cohort 3</b>							
	Pretest		Posttest (Unadjusted)		Posttest (Adjusted)		n
	Mean	SE Mean	Mean	SE Mean	Mean	SE Mean	
PC	3.74	.10	3.84	.10	3.89	.13	493
Control	3.52	.11	3.82	.12	3.76	.17	343
Adj. $\bar{\chi}$ Difference	SE Difference		Sig. Difference		Effect Size		Improvement Index
.12	.27		NS		.06		+2
Source	SS	df	Mean Square	F	Sig.	Partial $\eta^2$	
PC/Control	.90	1	.90	.20	NS	.00	
School	2.83	1	2.83	.64	NS	.00	
Pretest Govt. Service	472.25	1	472.25	105.86	.00	.12	

**Table B12**  
**ANCOVA Analysis of High School Students' Future Government Service**

<b>Cohort 1</b>							
	Pretest		Posttest (Unadjusted)		Posttest (Adjusted)		n
	Mean	SE Mean	Mean	SE Mean	Mean	SE Mean	
PC	3.45	.13	3.72	.14	3.66	.11	641
Control	3.31	.08	3.51	.09	3.54	.07	294
Adj. $\bar{\chi}$ Difference Diff.	SE Difference		Sig. Difference		Effect Size		Improvement Index
.11	.13		NS		.04		+2
Source	SS	df	Mean Square	F	Sig.	Partial $\eta^2$	
PC/Control	2.51	1	2.51	.64	NS	.00	
School	7.51	1	7.51	2.51	NS	.00	
Pretest Govt. Service	1547.05	1	1547.05	453.76	.00	.33	
<b>Cohort 2</b>							
	Pretest		Posttest (Unadjusted)		Posttest (Adjusted)		n
	Mean	SE Mean	Mean	SE Mean	Mean	SE Mean	
PC	3.07	.10	3.68	.11	3.67	.11	437
Control	3.03	.11	3.38	.13	3.39	.10	322
Adj. $\bar{\chi}$ Difference Diff.	SE Difference		Sig. Difference		Effect Size		Improvement Index
.28	.15		.05		.12		+5
Source	SS	df	Mean Square	F	Sig.	Partial $\eta^2$	
PC/Control	12.90	1	12.90	3.62	.07	.00	
School	.01	1	.01	.01	NS	.00	
Pretest Govt. Service	1006.79	1	1006.79	254.50	.00	.26	
<b>Cohort 3</b>							
	Pretest		Posttest (Unadjusted)		Posttest (Adjusted)		n
	Mean	SE Mean	Mean	SE Mean	Mean	SE Mean	
PC	3.11	.11	3.86	.13	3.85	.17	528
Control	3.23	.09	3.52	.10	3.60	.13	339
Adj. $\bar{\chi}$ Difference Diff.	SE Difference		Sig. Difference		Effect Size		Improvement Index
.25	.16		.05		.11		+4
Source	SS	df	Mean Square	F	Sig.	Partial $\eta^2$	
PC/Control	1.04	1	1.04	.24	NS	.00	
School	6.59	1	6.59	1.50	NS	.00	
Pretest Govt. Service	802.09	1	802.09	183.17	.00	.18	

**Table B13**  
**ANCOVA Analysis of Middle School Students' Trust in Government**

<b>Cohort 1</b>							
	Pretest		Posttest (Unadjusted)		Posttest (Adjusted)		n
	Mean	SE Mean	Mean	SE Mean	Mean	SE Mean	
PC	3.13	.05	3.14	.05	3.12	.05	304
Control	3.03	.05	2.99	.05	2.01	.05	342
Adj. $\bar{\chi}$ Group Diff.	SE Difference		Sig. Difference		Effect Size		Improvement Index
.11	.07		NS		.11		+4
Source	SS	df	Mean Square	F	Sig.	Partial $\eta^2$	
PC/Control	1.86	1	1.86	2.09	NS	.00	
School	.39	1	.39	.447	NS	.00	
Pretest Govt. Trust	88.87	1	88.87	99.65	.00	.13	
<b>Cohort 2</b>							
	Pretest		Posttest (Unadjusted)		Posttest (Adjusted)		n
	Mean	SE Mean	Mean	SE Mean	Mean	SE Mean	
PC	3.16	.05	3.25	.05	3.20	.05	339
Control	3.01	.05	2.98	.05	3.07	.06	423
Adj. $\bar{\chi}$ Group Diff.	SE Difference		Sig. Difference		Effect Size		Improvement Index
.13	.09		NS		.10		+4
Source	SS	df	Mean Square	F	Sig.	Partial $\eta^2$	
PC/Control	1.55	1	1.55	1.86	NS	.00	
School	2.36	1	2.36	2.84	NS	.00	
Pretest Govt. Trust	73.65	1	73.65	88.58	.00	.14	
<b>Cohort 3</b>							
	Pretest		Posttest (Unadjusted)		Posttest (Adjusted)		n
	Mean	SE Mean	Mean	SE Mean	Mean	SE Mean	
PC	3.07	.04	3.14	.04	3.10	.06	496
Control	2.96	.05	2.98	.06	3.03	.08	360
Adj. $\bar{\chi}$ Group Diff.	SE Difference		Sig. Difference		Effect Size		Improvement Index
.06	.12		NS		.06		+2
Source	SS	df	Mean Square	F	Sig.	Partial $\eta^2$	
PC/Control	.25	1	.25	.23	NS	.00	
School	.43	1	.43	.39	NS	.00	
Pretest Govt. Trust	49.89	1	49.89	45.95	.00	.05	

**Table B14**  
**ANCOVA Analysis of High School Students' Trust in Government**

<b>Cohort 1</b>							
	Pretest		Posttest (Unadjusted)		Posttest (Adjusted)		n
	Mean	SE Mean	Mean	SE Mean	Mean	SE Mean	
PC	2.76	.04	2.89	.04	2.90	.04	634
Control	2.87	.06	2.83	.06	2.79	.05	289
Adj. $\bar{x}$ Group Diff.	SE Difference		Sig. Difference		Effect Size		Improvement Index
.11	.06		NS		.11		+4
Source	SS	df	Mean Square	F	Sig.	Partial $\eta^2$	
PC/Control	2.23	1	2.23	2.46	NS	.00	
School	1.16	1	1.16	1.26	NS	.00	
Pretest Govt. Trust	189.41	1	189.41	208.59	.00	.19	
<b>Cohort 2</b>							
	Pretest		Posttest (Unadjusted)		Posttest (Adjusted)		n
	Mean	SE Mean	Mean	SE Mean	Mean	SE Mean	
PC	2.78	.05	2.85	.05	2.86	.05	434
Control	2.85	.05	2.91	.05	2.88	.10	319
Adj. $\bar{x}$ Group Diff.	SE Difference		Sig. Difference		Effect Size		Improvement Index
.02	.12		NS		.01		0
Source	SS	df	Mean Square	F	Sig.	Partial $\eta^2$	
PC/Control	.02	1	.02	.03	NS	.00	
School	.37	1	.37	.42	NS	.00	
Pretest Govt. Trust	72.13	1	72.13	81.15	.00	.13	
<b>Cohort 3</b>							
	Pretest		Posttest (Unadjusted)		Posttest (Adjusted)		n
	Mean	SE Mean	Mean	SE Mean	Mean	SE Mean	
PC	2.71	.04	2.94	.04	2.85	.06	529
Control	2.72	.05	2.76	.05	2.80	.08	360
Adj. $\bar{x}$ Group Diff.	SE Difference		Sig. Difference		Effect Size		Improvement Index
.05	.12		NS		.04		+2
Source	SS	df	Mean Square	F	Sig.	Partial $\eta^2$	
PC/Control	.18	1	.18	.19	NS	.00	
School	5.13	1	5.13	5.37	NS	.01	
Pretest Govt. Trust	146.52	1	146.52	153.44	.00	.15	

**Table B15**  
**ANCOVA Analysis of Middle School Students' Media Trust**

<b>Cohort 1</b>							
	Pretest		Posttest (Unadjusted)		Posttest (Adjusted)		n
	Mean	SE Mean	Mean	SE Mean	Mean	SE Mean	
PC	2.70	.06	2.78	.06	2.80	.05	304
Control	2.77	.05	2.74	.05	2.73	.05	342
Adj. $\bar{x}$ Group Diff.	SE Difference		Sig. Difference		Effect Size		Improvement Index
.07	.07		NS		.07		+3
Source	SS	df	Mean Square	F	Sig.	Partial $\eta^2$	
PC/Control	.75	1	.75	.86	NS	.00	
School	.05	1	.05	.05	NS	.00	
Pretest Media Trust	82.39	1	82.39	95.32	.00	.13	
<b>Cohort 2</b>							
	Pretest		Posttest (Unadjusted)		Posttest (Adjusted)		n
	Mean	SE Mean	Mean	SE Mean	Mean	SE Mean	
PC	2.87	.05	2.95	.05	2.91	.05	339
Control	2.87	.04	2.77	.05	2.78	.07	423
Adj. $\bar{x}$ Group Diff.	SE Difference		Sig. Difference		Effect Size		Improvement Index
.12	.09		NS		.14		+6
Source	SS	df	Mean Square	F	Sig.	Partial $\eta^2$	
PC/Control	1.34	1	1.34	1.62	NS	.00	
School	3.56	1	3.56	4.28	.04	.01	
Pretest Media Trust	30.71	1	30.71	37.00	.00	.06	
<b>Cohort 3</b>							
	Pretest		Posttest (Unadjusted)		Posttest (Adjusted)		n
	Mean	SE Mean	Mean	SE Mean	Mean	SE Mean	
PC	2.82	.04	2.86	.05	2.87	.06	496
Control	2.90	.05	2.77	.05	2.75	.08	360
Adj. $\bar{x}$ Group Diff.	SE Difference		Sig. Difference		Effect Size		Improvement Index
.11	.12		NS		.11		+4
Source	SS	df	Mean Square	F	Sig.	Partial $\eta^2$	
PC/Control	.81	1	.81	.80	NS	.00	
School	.00	1	.00	.00	NS	.00	
Pretest Media Trust	18.70	1	18.70	18.29	.00	.02	

**Table B16**  
**ANCOVA Analysis of High School Students' Media Trust**

<b>Cohort 1</b>							
	Pretest		Posttest (Unadjusted)		Posttest (Adjusted)		n
	Mean	SE Mean	Mean	SE Mean	Mean	SE Mean	
PC	2.64	.03	2.79	.03	2.78	.04	634
Control	2.55	.04	2.68	.04	2.70	.05	289
Adj. $\bar{x}$ Group Diff.	SE Difference		Sig. Difference		Effect Size		Improvement Index
.08	.06		NS		.07		+3
Source	SS	df	Mean Square	F	Sig.	Partial $\eta^2$	
PC/Control	1.22	1	1.22	1.43	NS	.00	
School	2.37	1	2.37	2.77	NS	.00	
Pretest Media Trust	149.54	1	149.54	175.18	.00	.16	
<b>Cohort 2</b>							
	Pretest		Posttest (Unadjusted)		Posttest (Adjusted)		n
	Mean	SE Mean	Mean	SE Mean	Mean	SE Mean	
PC	2.73	.04	2.86	.04	2.84	.04	434
Control	2.63	.05	2.87	.05	2.89	.05	319
Adj. $\bar{x}$ Group Diff.	SE Difference		Sig. Difference		Effect Size		Improvement Index
-.05	.07		NS		.06		+2
Source	SS	df	Mean Square	F	Sig.	Partial $\eta^2$	
PC/Control	.82	1	.82	1.05	NS	.00	
School	.26	1	.26	.34	NS	.00	
Pretest Media Trust	72.75	1	72.75	93.57	.00	.15	
<b>Cohort 3</b>							
	Pretest		Posttest (Unadjusted)		Posttest (Adjusted)		n
	Mean	SE Mean	Mean	SE Mean	Mean	SE Mean	
PC	2.72	.05	2.94	.06	2.75	.06	529
Control	2.60	.04	2.73	.04	2.76	.06	360
Adj. $\bar{x}$ Group Diff.	SE Difference		Sig. Difference		Effect Size		Improvement Index
.01	.12		NS		.00		0
Source	SS	df	Mean Square	F	Sig.	Partial $\eta^2$	
PC/Control	.01	1	.01	.01	NS	.00	
School	.54	1	.54	.59	NS	.00	
Pretest Media Trust	81.66	1	81.66	88.68	.01	.10	



**Table B17**  
**ANCOVA Analysis of Project-Based Pedagogies Index**

<b>Cohort 1</b>							
	Pretest		Posttest (Unadjusted)		Posttest (Adjusted)		n
	Mean	SE Mean	Mean	SE Mean	Mean	SE Mean	
PC	12.23	.66	16.18	.54	16.37	.55	36
Control	13.68	1.15	11.36	1.21	10.91	.84	27
Adj. $\bar{\chi}$ Group Diff.	SE Difference		Sig. Difference		Effect Size		Improvement Index
5.47	1.01		.00		33%		1.15
Source	SS		df	Mean Square	F	Sig.	Partial $\eta^2$
PC/Control	451.20		1	451.20	29.29	.00	.30
Pretest Pedagogies	360.41		1	360.41	23.41	.00	.25
<b>Cohort 2</b>							
	Pretest		Posttest (Unadjusted)		Posttest (Adjusted)		n
	Mean	SE Mean	Mean	SE Mean	Mean	SE Mean	
PC	12.65	.82	16.48	.79	16.28	.79	34
Control	11.67	1.03	9.28	1.17	9.57	.93	27
Adj. $\bar{\chi}$ Group Diff.	SE Difference		Sig. Difference		Effect Size		Improvement Index
6.71	1.22		.00		41%		1.40
Source	SS		df	Mean Square	F	Sig.	Partial $\eta^2$
PC/Control	541.56		1	541.56	30.11	.00	.39
Pretest Pedagogies	246.05		1	246.05	13.68	.00	.22
<b>Cohort 3</b>							
	Pretest		Posttest (Unadjusted)		Posttest (Adjusted)		n
	Mean	SE Mean	Mean	SE Mean	Mean	SE Mean	
PC	11.56	.96	14.63	.95	14.57	.86	39
Control	11.07	1.19	9.89	.87	9.96	.93	33
Adj. $\bar{\chi}$ Group Diff.	SE Difference		Sig. Difference		Effect Size		Improvement Index
4.69	1.26		.00		32%		.92
Source	SS		df	Mean Square	F	Sig.	Partial $\eta^2$
PC/Control	310.55		1	310.55	13.28	.00	.19
Pretest Pedagogies	129.31		1	129.31	5.53	.02	.09

**Table B18**  
**ANCOVA Analysis of Active Pedagogies Index**

<b>Cohort 1</b>							
	Pretest		Posttest (Unadjusted)		Posttest (Adjusted)		n
	Mean	SE Mean	Mean	SE Mean	Mean	SE Mean	
PC	1.54	.19	4.17	.17	4.25	.22	36
Control	2.09	.44	1.67	.37	1.56	.35	27
Adj. $\bar{\chi}$ Group Diff.	SE Difference		Sig. Difference		Effect Size		Improvement Index
2.69	.41		.00		1.57		+44
Source	SS	df	Mean Square	F	Sig.	Partial $\eta^2$	
PC/Control	107.43	1	107.43	41.98	.00	.38	
Pretest Pedagogies	25.66	1	25.66	10.41	.00	.13	
<b>Cohort 2</b>							
	Pretest		Posttest (Unadjusted)		Posttest (Adjusted)		n
	Mean	SE Mean	Mean	SE Mean	Mean	SE Mean	
PC	2.03	.31	4.80	.33	4.75	.28	34
Control	1.80	.42	1.19	.38	1.26	.22	27
Adj. $\bar{\chi}$ Group Diff.	SE Difference		Sig. Difference		Effect Size		Improvement Index
3.49	.62		.00		1.40		+42
Source	SS	df	Mean Square	F	Sig.	Partial $\eta^2$	
PC/Control	149.93	1	149.93	63.32	.00	.56	
Pretest Pedagogies	44.55	1	44.55	18.55	.00	.27	
<b>Cohort 3</b>							
	Pretest		Posttest (Unadjusted)		Posttest (Adjusted)		n
	Mean	SE Mean	Mean	SE Mean	Mean	SE Mean	
PC	2.00	.32	4.05	.28	4.05	.28	39
Control	2.00	.34	1.65	.32	1.65	.32	33
Adj. $\bar{\chi}$ Group Diff.	SE Difference		Sig. Difference		Effect Size		Improvement Index
2.40	.43		.00		1.39		+42
Source	SS	df	Mean Square	F	Sig.	Partial $\eta^2$	
PC/Control	178.57	1	178.57	33.62	.00	.35	
Pretest Pedagogies	18.08	1	18.08	3.39	NS	.05	

**Table B19**  
**ANCOVA Analysis of Middle School Students' Civic Skills**

<b>Cohort 1</b>							
	Pretest		Posttest (Unadjusted)		Posttest (Adjusted)		n
	Mean	SE Mean	Mean	SE Mean	Mean	SE Mean	
PC	7.70	.13	8.28	.13	8.24	.12	314
Control	7.64	.14	7.79	.14	7.83	.12	351
Adj. $\bar{x}$ Group Diff.	SE Difference		Sig. Difference		Effect Size		Improvement Index
.41	.17		.02		.16		+6
Source	SS	df	Mean Square	F	Sig.	Partial $\eta^2$	
PC/Control	27.13	1	27.13	5.66	.02	.01	
School	31.57	1	31.57	6.59	.01	.01	
Pretest Confidence	1127.56	1	1127.56	235.35	.00	.27	
<b>Cohort 2</b>							
	Pretest		Posttest (Unadjusted)		Posttest (Adjusted)		n
	Mean	SE Mean	Mean	SE Mean	Mean	SE Mean	
PC	7.23	.14	8.16	.13	8.33	.13	347
Control	7.94	.13	8.07	.12	7.88	.16	433
Adj. $\bar{x}$ Group Diff.	SE Difference		Sig. Difference		Effect Size		Improvement Index
.45	.23		.05		.19		+8
Source	SS	df	Mean Square	F	Sig.	Partial $\eta^2$	
PC/Control	19.12	1	19.12	3.98	.05	.01	
School	9.90	1	9.90	2.06	NS	.00	
Pretest Confidence	512.14	1	512.14	106.72	.00	.16	
<b>Cohort 3</b>							
	Pretest		Posttest (Unadjusted)		Posttest (Adjusted)		n
	Mean	SE Mean	Mean	SE Mean	Mean	SE Mean	
PC	7.33	.11	7.79	.11	7.66	.15	504
Control	7.11	.13	7.15	.14	7.31	.19	381
Adj. $\bar{x}$ Group Diff.	SE Difference		Sig. Difference		Effect Size		Improvement Index
.34	.31		NS		.13		+5
Source	SS	df	Mean Square	F	Sig.	Partial $\eta^2$	
PC/Control	7.83	1	7.83	1.22	NS	.00	
School	5.27	1	5.27	.84	NS	.00	
Pretest Confidence	498.43	1	498.43	79.16	.00	.08	

**Table B20**  
**ANCOVA Analysis of High School Students' Civic Skills**

<b>Cohort 1</b>							
	Pretest		Posttest (Unadjusted)		Posttest (Adjusted)		n
	Mean	SE Mean	Mean	SE Mean	Mean	SE Mean	
PC	8.29	.09	8.89	.09	8.89	.08	642
Control	8.31	.16	8.43	.16	8.42	.12	293
Adj. $\bar{x}$ Group Diff.	SE Difference		Sig. Difference		Effect Size		Improvement Index
.46	.14		.00		.19		+8
Source	SS	df	Mean Square	F	Sig.	Partial $\eta^2$	
PC/Control	42.49	1	42.49	10.01	.00	.01	
School	22.58	1	22.58	5.32	.02	.01	
Pretest Confidence	1821.51	1	1821.51	429.32	.00	.32	
<b>Cohort 2</b>							
	Pretest		Posttest (Unadjusted)		Posttest (Adjusted)		n
	Mean	SE Mean	Mean	SE Mean	Mean	SE Mean	
PC	7.86	.12	8.67	.11	8.67	.11	440
Control	7.79	.13	8.27	.14	8.13	.23	323
Adj. $\bar{x}$ Group Diff.	SE Difference		Sig. Difference		Effect Size		Improvement Index
.53	.28		.05		.22		+9
Source	SS	df	Mean Square	F	Sig.	Partial $\eta^2$	
PC/Control	15.67	1	15.67	3.47	.06	.01	
School	4.55	1	4.55	1.01	NS	.00	
Pretest Confidence	629.99	1	629.99	139.73	.00	.20	
<b>Cohort 3</b>							
	Pretest		Posttest (Unadjusted)		Posttest (Adjusted)		n
	Mean	SE Mean	Mean	SE Mean	Mean	SE Mean	
PC	7.56	.09	8.26	.11	8.46	.13	533
Control	7.82	.11	8.36	.12	8.11	.18	347
Adj. $\bar{x}$ Group Diff.	SE Difference		Sig. Difference		Effect Size		Improvement Index
.34	.27		NS		.15		+6
Source	SS	df	Mean Square	F	Sig.	Partial $\eta^2$	
PC/Control	7.40	1	7.40	1.53	NS	.00	
School	12.65	1	12.65	2.61	NS	.00	
Pretest Confidence	574.44	1	574.44	118.42	.00	.12	

**Table B21**  
**ANCOVA Analysis of Teachers' Self-Efficacy Index by Condition**

<b>Cohort 1</b>							
	Pretest		Posttest (Unadjusted)		Posttest (Adjusted)		n
	Mean	SE Mean	Mean	SE Mean	Mean	SE Mean	
PC	19.29	.89	22.24	.78	22.51	.63	36
Control	20.15	.89	19.89	1.16	19.53	.73	27
Adj. $\bar{\chi}$ Group Diff.	SE Difference		Sig. Difference		Effect Size		Improvement Index
2.98	.97		.00		.50		+19
Source	SS		df	Mean Square	F	Sig.	Partial $\eta^2$
PC/Control	137.70		1	137.70	9.38	.00	.13
Pretest Efficacy	882.09		1	882.09	60.09	.00	.50
<b>Cohort 2</b>							
	Pretest		Posttest (Unadjusted)		Posttest (Adjusted)		n
	Mean	SE Mean	Mean	SE Mean	Mean	SE Mean	
PC	18.77	1.36	20.52	1.01	20.79	.89	34
Control	20.61	1.06	18.56	1.07	18.19	1.04	27
Adj. $\bar{\chi}$ Group Diff.	SE Difference		Sig. Difference		Effect Size		Improvement Index
2.59	1.38		.05		.42		+16
Source	SS		df	Mean Square	F	Sig.	Partial $\eta^2$
PC/Control	86.84		1	86.84	3.51	.05	.06
Pretest Efficacy	279.31		1	279.31	11.28	.00	.18
<b>Cohort 3</b>							
	Pretest		Posttest (Unadjusted)		Posttest (Adjusted)		n
	Mean	SE Mean	Mean	SE Mean	Mean	SE Mean	
PC	20.51	.72	21.87	.68	21.57	.71	39
Control	18.80	.91	17.53	.98	17.82	.82	33
Adj. $\bar{\chi}$ Group Diff.	SE Difference		Sig. Difference		Effect Size		Improvement Index
3.65	1.01		.00		.76		+28
Source	SS		df	Mean Square	F	Sig.	Partial $\eta^2$
PC/Control	218.07		1	218.07	11.01	.00	.14
Pretest Efficacy	244.71		1	244.71	12.35	.00	.16

**Table B22**  
**ANCOVA Analysis of Middle School Students' Problem-Solving Skills**

<b>Cohort 1</b>							
	Pretest		Posttest (Unadjusted)		Posttest (Adjusted)		n
	Mean	SE Mean	Mean	SE Mean	Mean	SE Mean	
PC	20.87	.30	21.45	.29	21.14	.24	303
Control	19.82	.29	19.85	.28	20.13	.24	325
Adj. $\bar{x}$ Group Diff.	SE Difference		Sig. Difference		Effect Size		Improvement Index
1.01	.34		.00		.20		+8
Source	SS	df	Mean Square	F	Sig.	Partial $\eta^2$	
PC/Control	157.14	1	157.14	8.65	.00	.02	
School	44.97	1	44.97	2.47	NS	.00	
Pretest Prob-Solve	494.60	1	494.60	253.01	.00	.29	
<b>Cohort 2</b>							
	Pretest		Posttest (Unadjusted)		Posttest (Adjusted)		n
	Mean	SE Mean	Mean	SE Mean	Mean	SE Mean	
PC	19.12	.34	19.89	.32	20.12	.29	309
Control	19.60	.29	19.96	.25	19.96	.36	404
Adj. $\bar{x}$ Group Diff.	SE Difference		Sig. Difference		Effect Size		Improvement Index
.16	.76		NS		.03		+1
Source	SS	df	Mean Square	F	Sig.	Partial $\eta^2$	
PC/Control	2.21	1	2.21	.10	NS	.00	
School	1.03	1	1.03	.05	NS	.00	
Pretest Prob-Solve	2903.03	1	2903.03	128.62	.00	.20	
<b>Cohort 3</b>							
	Pretest		Posttest (Unadjusted)		Posttest (Adjusted)		n
	Mean	SE Mean	Mean	SE Mean	Mean	SE Mean	
PC	17.69	.29	18.62	.28	18.63	.35	445
Control	17.64	.34	18.25	.32	18.23	.46	314
Adj. $\bar{x}$ Group Diff.	SE Difference		Sig. Difference		Effect Size		Improvement Index
.39	.70		NS		.07		+3
Source	SS	df	Mean Square	F	Sig.	Partial $\eta^2$	
PC/Control	9.60	1	9.60	.31	NS	.00	
School	.23	1	.23	.01	NS	.00	
Pretest Prob-Solve	3560.08	1	3560.08	115.01	.00	.13	

**Table B23**  
**ANCOVA Analysis of High School Students' Problem-Solving Skills**

<b>Cohort 1</b>							
	Pretest		Posttest (Unadjusted)		Posttest (Adjusted)		n
	Mean	SE Mean	Mean	SE Mean	Mean	SE Mean	
PC	21.91	.18	21.02	.31	22.14	.17	631
Control	22.27	.18	20.79	.33	21.10	.15	287
Adj. $\bar{x}$ Group Diff.	SE Difference		Sig. Difference		Effect Size		Improvement Index
1.03	.31		.00		.27		+10
Source	SS	df	Mean Square	F	Sig.	Partial $\eta^2$	
PC/Control	209.18	1	209.18	11.06	.00	.02	
School	189.38	1	189.38	10.01	.00	.01	
Pretest Prob-Solve	4856.63	1	4856.63	256.75	.00	.22	
<b>Cohort 2</b>							
	Pretest		Posttest (Unadjusted)		Posttest (Adjusted)		n
	Mean	SE Mean	Mean	SE Mean	Mean	SE Mean	
PC	21.11	.23	21.54	.24	21.58	.24	420
Control	20.86	.27	20.73	.30	19.78	.53	311
Adj. $\bar{x}$ Group Diff.	SE Difference		Sig. Difference		Effect Size		Improvement Index
1.79	.64		.00		.34		+13
Source	SS	df	Mean Square	F	Sig.	Partial $\eta^2$	
PC/Control	171.34	1	171.34	7.82	.01	.02	
School	48.42	1	48.42	2.12	NS	.00	
Pretest Prob-Solve	3909.17	1	3909.17	91.37	.00	.15	
<b>Cohort 3</b>							
	Pretest		Posttest (Unadjusted)		Posttest (Adjusted)		n
	Mean	SE Mean	Mean	SE Mean	Mean	SE Mean	
PC	19.73	.23	20.39	.25	20.40	.32	501
Control	19.20	.31	19.90	.31	19.91	.44	325
Adj. $\bar{x}$ Group Diff.	SE Difference		Sig. Difference		Effect Size		Improvement Index
.48	.66		NS		.09		+4
Source	SS	df	Mean Square	F	Sig.	Partial $\eta^2$	
PC/Control	14.28	1	14.28	.525	NS	.00	
School	3.69	1	3.69	.156	NS	.00	
Pretest Prob-Solve	3930.89	1	3930.89	144.56	.00	.14	

**Table B24**  
**ANCOVA Analysis of Middle School Students' Civic Expression Skills**

<b>Cohort 1</b>							
	Pretest		Posttest (Unadjusted)		Posttest (Adjusted)		n
	Mean	SE Mean	Mean	SE Mean	Mean	SE Mean	
PC	14.29	.35	15.52	.34	15.35	.28	289
Control	13.85	.34	14.25	.32	14.40	.26	315
Adj. $\bar{x}$ Group Diff.	SE Difference		Sig. Difference		Effect Size		Improvement Index
.95	.39		.01		6%		+7
Source	SS	df	Mean Square	F	Sig.	Partial $\eta^2$	
PC/Control	134.65	1	134.65	5.94	.01	.01	
School	111.06	1	111.06	4.90	.03	.01	
Pretest Expression	6319.09	1	6319.09	278.85	.00	.32	
<b>Cohort 2</b>							
	Pretest		Posttest (Unadjusted)		Posttest (Adjusted)		n
	Mean	SE Mean	Mean	SE Mean	Mean	SE Mean	
PC	13.24	.36	14.75	.33	14.78	.32	300
Control	13.58	.28	14.29	.28	14.51	.39	389
Adj. $\bar{x}$ Group Diff.	SE Difference		Sig. Difference		Effect Size		Improvement Index
.26	.55		NS		2%		+2
Source	SS	df	Mean Square	F	Sig.	Partial $\eta^2$	
PC/Control	5.76	1	5.76	.23	NS	.00	
School	6.65	1	6.65	.26	NS	.00	
Pretest Expression	3990.57	1	3990.57	156.82	.00	.24	
<b>Cohort 3</b>							
	Pretest		Posttest (Unadjusted)		Posttest (Adjusted)		n
	Mean	SE Mean	Mean	SE Mean	Mean	SE Mean	
PC	12.02	.29	13.53	.29	13.57	.37	439
Control	11.86	.34	12.67	.35	12.64	.48	316
Adj. $\bar{x}$ Group Diff.	SE Difference		Sig. Difference		Effect Size		Improvement Index
.92	.74		.00		7%		+6
Source	SS	df	Mean Square	F	Sig.	Partial $\eta^2$	
PC/Control	53.89	1	53.89	1.55	NS	.00	
School	.72	1	.72	.02	NS	.00	
Pretest Expression	2713.83	1	2713.83	78.11	.00	.10	



**Table B25**  
**ANCOVA Analysis of High School Students' Civic Expression Skills**

<b>Cohort 1</b>							
	Pretest		Posttest (Unadjusted)		Posttest (Adjusted)		n
	Mean	SE Mean	Mean	SE Mean	Mean	SE Mean	
PC	16.32	.21	17.41	.19	17.24	.17	627
Control	15.33	.34	15.56	.35	16.04	.26	285
<b>Adj. <math>\bar{\chi}</math> Group Diff.</b>							
	SE Difference	Sig. Difference	Percentage Difference	Effect Size	Improvement Index		
	1.20	.00	7%	.25	+6		
<b>Source</b>							
	SS	df	Mean Square	F	Sig.	Partial $\eta^2$	
PC/Control	279.49	1	279.49	14.03	.00	.02	
School	66.08	1	66.08	3.31	.07	.00	
Pretest Expression	7656.38	1	7656.38	384.33	.00	.30	
<b>Cohort 2</b>							
	Pretest		Posttest (Unadjusted)		Posttest (Adjusted)		n
	Mean	SE Mean	Mean	SE Mean	Mean	SE Mean	
PC	15.32	.26	16.57	.26	16.61	.26	417
Control	15.33	.31	15.42	.32	14.87	.56	313
<b>Adj. <math>\bar{\chi}</math> Group Diff.</b>							
	SE Difference	Sig. Difference	Percentage Difference	Effect Size	Improvement Index		
	1.74	.00	11%	.31	+12		
<b>Source</b>							
	SS	df	Mean Square	F	Sig.	Partial $\eta^2$	
PC/Control	163.48	1	163.48	6.68	.01	.01	
School	27.77	1	27.77	1.13	NS	.00	
Pretest Expression	2922.07	1	2922.07	119.45	.00	.18	
<b>Cohort 3</b>							
	Pretest		Posttest (Unadjusted)		Posttest (Adjusted)		n
	Mean	SE Mean	Mean	SE Mean	Mean	SE Mean	
PC	13.75	.26	14.80	.27	14.68	.34	497
Control	13.00	.34	14.36	.35	14.55	.47	319
<b>Adj. <math>\bar{\chi}</math> Group Diff.</b>							
	SE Difference	Sig. Difference	Percentage Difference	Effect Size	Improvement Index		
	.12	NS	1%	.02	+1		
<b>Source</b>							
	SS	df	Mean Square	F	Sig.	Partial $\eta^2$	
PC/Control	.92	1	.92	.03	NS	.00	
School	.28	1	.28	.01	NS	.00	
Pretest Expression	6662.33	1	6662.33	220.87	.00	.21	

**Table B26**  
**ANCOVA Analysis of Middle School Students' STEM Index**

<b>Cohort 1</b>							
	Pretest		Posttest (Unadjusted)		Posttest (Adjusted)		n
	Mean	SE Mean	Mean	SE Mean	Mean	SE Mean	
PC	8.00	.14	8.54	.13	8.59	.13	312
Control	8.26	.14	7.80	.15	7.73	.13	338
Adj. $\bar{\chi}$ Group Diff.	SE Difference		Sig. Difference		Effect Size		Improvement Index
.86	.19		.00		.31		+12
Source	SS	df	Mean Square	F	Sig.	Partial $\eta^2$	
PC/Control	127.42	1	127.42	20.08	.00	.03	
School	4.41	1	4.41	.69	NS	.00	
Pretest STEM	990.35	1	990.35	156.10	.00	.18	
<b>Cohort 2</b>							
	Pretest		Posttest (Unadjusted)		Posttest (Adjusted)		n
	Mean	SE Mean	Mean	SE Mean	Mean	SE Mean	
PC	7.76	.15	8.23	.15	8.29	.13	373
Control	7.76	.14	7.90	.12	7.96	.12	412
Adj. $\bar{\chi}$ Group Diff.	SE Difference		Sig. Difference		Effect Size		Improvement Index
.33	.18		.07		.12		+5
Source	SS	df	Mean Square	F	Sig.	Partial $\eta^2$	
PC/Control	18.98	1	18.98	3.09	.07	.01	
School	.06	1	.06	.01	NS	.00	
Pretest Expression	1078.65	1	1078.65	175.61	.00	.18	
<b>Cohort 3</b>							
	Pretest		Posttest (Unadjusted)		Posttest (Adjusted)		n
	Mean	SE Mean	Mean	SE Mean	Mean	SE Mean	
PC	7.58	.12	8.01	.12	7.95	.16	439
Control	7.59	.14	7.61	.15	7.71	.22	353
Adj. $\bar{\chi}$ Group Diff.	SE Difference		Sig. Difference		Effect Size		Improvement Index
.24	.33		NS		.09		+4
Source	SS	df	Mean Square	F	Sig.	Partial $\eta^2$	
PC/Control	4.09	1	4.09	.52	NS	.00	
School	2.73	1	2.73	.35	NS	.00	
Pretest Expression	676.81	1	676.81	85.71	.00	.08	

**Table B27**  
**ANCOVA Analysis of High School Students' STEM Index**

<b>Cohort 1</b>							
	Pretest		Posttest (Unadjusted)		Posttest (Adjusted)		n
	Mean	SE Mean	Mean	SE Mean	Mean	SE Mean	
PC	7.44	.11	8.06	.11	8.43	.09	627
Control	7.63	.17	7.67	.17	7.95	.13	289
Adj. $\bar{x}$ Group Diff.	SE Difference		Sig. Difference		Effect Size		Improvement Index
.48	.16		.00		.17		+7
Source	SS	df	Mean Square	F	Sig.	Partial $\eta^2$	
PC/Control	45.44	1	45.44	8.57	.01	.01	
School	24.83	1	24.83	4.65	.03	.01	
Pretest Expression	1463.90	1	1463.90	274.35	.00	.23	
<b>Cohort 2</b>							
	Pretest		Posttest (Unadjusted)		Posttest (Adjusted)		n
	Mean	SE Mean	Mean	SE Mean	Mean	SE Mean	
PC	7.67	.12	8.36	.11	8.37	.11	480
Control	7.56	.14	7.82	.16	7.80	.14	315
Adj. $\bar{x}$ Group Diff.	SE Difference		Sig. Difference		Effect Size		Improvement Index
.57	.18		.00		.21		+8
Source	SS	df	Mean Square	F	Sig.	Partial $\eta^2$	
PC/Control	56.89	1	56.89	9.73	.00	.01	
School	11.44	1	11.44	1.96	NS	.00	
Pretest Expression	966.50	1	966.50	165.22	.00	.17	
<b>Cohort 3</b>							
	Pretest		Posttest (Unadjusted)		Posttest (Adjusted)		n
	Mean	SE Mean	Mean	SE Mean	Mean	SE Mean	
PC	7.46	.12	7.84	.12	7.93	.15	497
Control	7.42	.14	7.76	.15	7.72	.22	331
Adj. $\bar{x}$ Group Diff.	SE Difference		Sig. Difference		Effect Size		Improvement Index
.21	.32		NS		.08		+3
Source	SS	df	Mean Square	F	Sig.	Partial $\eta^2$	
PC/Control	2.80	1	2.80	.35	NS	.00	
School	.55	1	.55	.08	NS	.00	
Pretest Expression	566.08	1	566.08	80.26	.00	.08	

## **APPENDIX C**

### **KNOWLEDGE QUESTION WORDING**

## TEACHER CIVIC KNOWLEDGE ITEMS

John Locke states: "Absolute arbitrary power, or governing without settled laws, can neither of them be consistent with the ends of society and government." Which of the following statements is most consistent with the Locke quotation above? a) weak government is worse than no government, b) governmental power should be limited, c) laws should never be changed, d) only wise people can exercise power

The rights to life, liberty, and property are considered a) civil rights, b) natural rights, c) state's rights, d) personal rights

The idea that power comes from the people who elect representatives who are responsible to the people is known as a) popular sovereignty, b) limited government, c) majority rule, d) eminent domain

All of the following are true about the theory of classical republicanism EXCEPT that a) government must ensure that individual interests are paramount to public concerns, b) government promotes the public good, c) political power is vested in the electorate, d) government is administered by representatives who are responsible to the people

"We hold these truths to be self-evident: That all men are created equal; that they are endowed by their creator with certain unalienable rights; that among these are life, liberty, and the pursuit of happiness; . . ." This quotation is evidence that some of the basic ideas in the Declaration of Independence were a) limitations of the principles underlying most European governments of the 1700's, b) adaptations of the laws of Spanish colonial governments in North America, c) adoptions of rules used by the Holy Roman Empire, d) reflections of the philosophies of the European Enlightenment

That individual rights and freedoms are highly valued and protected is central to a) liberalism, b) constitutionalism, c) republicanism, d) federalism

According to the Declaration of Independence, the people have the right to alter or abolish a government if that government a) is a limited monarchy, b) violates natural rights, c) undercuts the rule of law, d) becomes involved in entangling alliances

In a republican government a) people directly participate in all government decisions, b) aristocrats hold power over the common people, c) government representatives are not accountable to the people, d) citizens elect representatives who make laws and run the government

A democratic form of government where the executive branch of government gains legitimacy from and is held accountable to the legislative branch is a a) unitary system, b) confederated system, c) national unity system, d) parliamentary system

Which of the following is a reason for the separation of powers? a) to ensure the power of the executive is not compromised, b) to promote equality of opportunity, c) to prevent tyranny by any one branch, d) to prevent gridlock in government

Which of the following serves as a long-term protection against tyranny and is a foundation of liberty in the United States? a) the commerce clause, b) the elastic clause, c) the right to trial, d) the rule of law

In a direct democracy, decisions are made collectively by citizens using a) enlightened representatives, b) oligarchy, c) plebiscites, d) majority rule

Which of the following powers is NOT allocated to the states by the U.S. Constitution? a) the power to create a Social Security system, b) the power to enter into an agreement with another state, c) the power to build infrastructure, such as highways, d) the power to enter into an agreement with another nation

A constitutional government is a) non-binding government, b) direct government, c) limited government, d) supreme government

Which of the following is NOT a characteristic of a constitutional government? a) the Constitution is a higher law that everyone must obey, b) the Constitution must be a written document, c) people agree to abide by the laws established by the federal government, d) people delegate powers to the government

Which of the following clauses in the U.S. Constitution justifies the "implied powers doctrine"? a) the contract clause, b) the executive power clause, c) the necessary and proper clause, d) the privileges and immunities clause

Substantive due process a) protects citizens from unjust laws, b) protects citizenship rights, c) guarantees economic liberty, d) applies due process provisions to the states

The primary purpose of the Bill of Rights was to a) limit the spread of slavery in the United States, b) limit the power of the federal government, c) establish judicial review, d) allot specific powers to the states

Which of the following is argued by James Madison in Federalist 10? a) a system of republican representation helps to limit the excesses of factionalism, b) the elimination of the causes of factionalism is the best protection against tyranny, c) the presence of a few large factions helps to protect minority rights, d) participatory democracy is the best way to prevent tyranny

The Constitution requires that the President's nominations to the Supreme Court be approved by the Senate. This is an example of a) separation of powers, b) federalism, c) checks and balances, d) judicial review

In the United States, what occurs when state and national laws are in conflict? a) the state law is enforced, b) the national law is enforced, c) the state decides which law to enforce, d) the public holds a referendum to decide which law should be enforced

Which Amendment states that those powers not given to the federal government and not prohibited to the states by the Constitution are reserved for the states and the people? a) 8<sup>th</sup>, b) 10<sup>th</sup>, c) 11<sup>th</sup>, d) 14<sup>th</sup>

Powers shared by the federal and state governments are a) concurrent, b) confederated, c) enumerated, d) unified

What action can Congress take if the Supreme Court finds a federal law is unconstitutional? a) Congress cannot override a Supreme Court decision, b) Congress can re-enact the same legislation, c) Congress can formally request that the President veto the Supreme Court's decision, d) Congress can appeal the Supreme Court decision to the District of Columbia Court of Appeals

Federalism is defined best as a) a constitutional arrangement by which power is distributed between a central government and state governments, b) a constitutional arrangement by which sovereign states create a limited central government, c) a loose association of states constitutionally created by a strong central government, d) a loose association of states with mutually recognized compacts but no central government

Which fact about American government is most closely associated with federalism? a) power is divided among legislative, executive, and judicial branches, b) private organizations in the United States do much of the work that is performed by local governments in other countries, c) citizens in the United States are subject to both state and federal laws, d) citizens in the United States have a right to protection from intrusion into their private affairs

What are reserved powers? a) powers specifically delegated to the national government by the Constitution, b) powers specifically delegated to state governments by the Constitution, c) powers that belong to the national government because they are not specifically delegated to the state governments by the Constitution, d) powers that belong to the states or people because they are not specifically delegated to the national government by the Constitution

Nationally, how many governments and government agencies are there in the United States? a) 38,000, b) 51,000, c) 90,000, d) 120,000

Which Supreme Court case established that the Constitution grants implied powers to Congress which can be used to implement the Constitution's express powers? a) Gibbons v. Ogden, b) McCulloch v. Maryland, c) Miranda v. Arizona, d) Mapp v. Ohio

Public policy is a) not a formal law or regulation, b) a concept or set of ideas that guides a course of action, c) an extra-governmental process for dealing with issues of public concern, d) made on behalf of specific interest groups

Affirmative action refers to efforts enforced by government to a) forbid discrimination on the basis of "race, color, religion, or national origin" in public accommodations and employment, b) increase the percentages of racial and ethnic minorities and women in higher education and the workplace, c) ensure that voting rights are extended fairly to all citizens, d) desegregate secondary schools

The concept of "positive rights" in United Nations' Universal Declaration of Rights requires that a) governments allow people to pursue liberty on their own terms, b) citizens are not to be subjected to an action of another person or group, c) governments can tell citizens how they may or may not act, d) governments assume responsibility of ensuring social welfare by providing services, such as health care

A key idea of pluralism is that the public interest will be best served by a political system that a) systematically incorporates only a few government-recognized umbrella organizations into the policy making process, b) is based on universal suffrage, c) maximizes efficiency in the policy making process, d) facilitates competition among groups, with each advocating its own policies

The part of society in which family, friends, and associates pursue their own interests within the law, free of unreasonable government intrusion is a) civil society, b) civic sphere, c) private sphere, d) free enterprise

Which of the following is part of civil society? a) a for-profit business, b) city government, c) a public utility, d) a non-profit organization

A crucial difference between interest groups and political parties is that a) interest groups seek to influence government, b) interest groups' primary function is to put forth candidates for public office, c) interest groups always indulge in 'gesture politics', d) an interest group typically accommodates a wide range of policy positions

Political interest groups play their largest role in shaping legislation by a) arguing before federal courts, b) petitioning the executive branch, c) persuading voters through mass media, d) lobbying members of Congress

What type of group is a trade association? a) a governmental unit, b) a public interest group, c) an economic interest group, d) a labor organization

Grassroots lobbying is best illustrated as a) creating a network of interest groups, b) building and maintaining goodwill with the general public, c) using high-paid professionals to contact legislators, d) inspiring constituents to contact their government representatives

How do lobbyists typically seek to influence members of Congress? a) by providing information to voters, b) by providing technical expertise on policy issues, c) by organizing protests on Capitol Hill, d) by proposing legislation



What is a key tenet of pluralism? a) all salient issues will be represented in government, b) only wealthy interests have influence over government decisions, c) government decisions reflect elite preferences, d) policy makers care more about public opinion than interest group preferences

The stage in the policy process where government recognizes that a problem is worthy of consideration for action is a) agenda setting, b) agenda adoption, c) policy formulation, d) policy implementation

Which of the following demonstrates how policy making is decentralized in the United States? a) the United States has a unitary form of government, b) congressional power often trumps state power, c) the states have authority over policy making in areas such as education, the federal government is responsible for health care policies

Implementation of public policies a) can be carried out by bureaucratic agencies, boards, commissions, and departments, b) receives the most attention from members of the public, c) can only be accomplished through Congress and state legislatures, d) is the exclusive domain of the executive branch

Which perspective holds that justice is achieved when there is fairness in the way information is gathered and decisions are made, especially in following the Constitution, the Bill of Rights, and U.S. legal codes? a) social justice, b) distributive justice, c) individual justice, d) procedural justice

Social networks, norms of generalized reciprocity, and interpersonal trust that fosters coordination for mutual benefit define a) political parties, b) civil society, c) social capital, d) civil engagement

## STUDENT CIVIC KNOWLEDGE ITEMS

The rights to life, liberty, and property are considered a) civil rights, b) natural rights, c) state's rights, d) personal rights

The idea that power comes from the people who elect representatives who are responsible to the people is known as a) popular sovereignty, b) limited government, c) majority rule, d) eminent domain

The idea that individual rights and freedoms are highly valued and protected is central to a) liberalism, b) republicanism, c) federalism, d) constitutionalism

Which term describes how power is divided between the three branches of government? a) federalism, b) divided government, c) checks and balances, d) separation of powers

The supremacy clause in the U.S. Constitution states that a) the federal government has the right to regulate interstate commerce, b) only Congress has the right to declare war, c) the Supreme Court has the power to overturn legislation, d) federal law takes precedence over state law when the laws conflict

What are the first ten amendments to the U.S. Constitution called? a) The Preamble, b) Bill of Rights, c) civil rights, d) Articles of Confederation

Powers shared by the federal and state governments are a) concurrent powers, b) confederated powers, c) enumerated powers, d) unified powers

In the United States, federalism is a) a constitutional arrangement where power is distributed between national and state governments, b) a system where the states have power over the national government, c) a system where the national and state governments act independently, d) a constitutional arrangement where sovereign states create a limited central government

Public policy is a) an agreed-upon way that our government fulfills its responsibilities, b) a concept or set of ideas that guides a course of action, c) a process that takes place outside of government for dealing with issues of public concern, d) always made on behalf of specific interests

Which of the following is a community solution to the problem of food scarcity? a) city officials providing vouchers for food, b) a religious organization operating a food pantry, c) the government giving money to farmers to provide food, d) county leaders conducting a survey to identify food needs in neighborhoods

Pluralism in government means that a) only a few organizations can be involved in the policy making process, b) universal suffrage is required, c) the policy making process is efficient and works fast, d) there is competition among groups, with each group advocating for its own policies

A non-profit organization working on public policy issues is part of a) the free enterprise system, b) civil society, c) a public utility, d) the private sphere

A political interest group is a) a type of political party, b) a government agency that works on issues of public policy, c) a business whose primary interest is making profits, d) an advocacy group which seeks to promote a particular idea or public policy

Grassroots lobbying is best defined as a) using high-paid professionals to contact political leaders, b) getting citizens to contact their elected representatives, c) interest groups joining together, d) getting elites and famous people to work on behalf of a cause

Which of the following is NOT an outcome of the policy making process a) laws, b) rules, c) regulations, d) anarchy

Distributive policy is a) a type of policy that takes benefits from one group of people and gives them to another, b) a set of tools available to the government to enact policy, c) a type of policy that provides benefits to all people, d) an informal list of issues that elected officials consider most important for action

Which of the following is a public policy that addresses animal rights? a) a volunteer animal shelter, b) veterinarians providing free care to animals, c) citizens lobbying for better laws protecting animals, d) a state law prohibiting puppy mills

Democratic decision making requires a) public policy to be made exclusively by elected officials, b) citizens to participate in government affairs, c) bureaucratic agencies, boards, commissions, and departments to enforce policies, d) citizens to relinquish their power to government officials

Reaching a consensus means that a) only some people's views are taken into consideration when reaching a decision, b) compromise is never reached, c) there is 100 percent agreement among all people involved in a decision, d) a compromise is reached that reasonably satisfies everyone

In American democracy, majority rule a) is limited to protect minority rights, b) is always restrained, c) is unlimited, d) results in tyranny of the minority



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