

**Citizenship Education through Participatory Budgeting:
the Case of Bioscience High School in Phoenix, Arizona**

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Abstract

Public participation in local decision-making processes has numerous purported benefits. Yet, realizing these benefits requires a citizenry that is able and willing to participate in meaningful ways. High schools are ideal venues for civic education but rarely teach local collective action, citizen engagement, and self-governance, focusing instead on personal responsibility, knowledge of political institutions, and information on electoral processes. This article reports on a citizenship education project in a high school in Phoenix, Arizona. The program engaged students from all grade levels in a participatory budgeting (PB) process – to our knowledge, the first School PB in the U.S. The study asked to what extent student engagement in PB contributed to democratic learning necessary to actively engage in public debates and decision-making processes. The findings suggest that deliberative processes that engage students in decision-making can develop civic competencies, and among available strategies, PB is particularly effective. The study also found that the impact of informal democratic learning through PB increases significantly when it is paired with formal learning in the classroom.

Keywords

Citizenship education; high schools; participatory budgeting; democratic learning; informal learning

1. Introduction

Expanding upon the Archbishop of York's assertion that the main purpose of education is to produce citizens, Eleanor Roosevelt (1930) argued that the true purpose of education is to produce good citizens. In many schools around the world, democratic citizenship is taught mainly through the memorization of historical, geographical and institutional facts (from articles of the Constitution to the number of judges in the Supreme Court to the names of state capitals). While this knowledge is certainly important, there is a long educational tradition that contends that it is also critical to learn democracy by experiencing it. This tradition, which can be traced at least to Rousseau, includes early experiments like the Yasnaya Polyana school in 19th century Russia, the Modern School in Spain and Summerhill in England in the early 20th century, and more recent ones like the citizenship schools in Brazil in the late 20th century (Rousseau, 1762/1979; Tolstoy, 1862/1982; Ferrer, 1913; Dewey, 1938; Neill, 1960; Gutmann, 1987; Freire 1998).

Following on these traditions of experiential learning, in this article we explore citizenship education lived through a democratic process of deliberation and decision-making. The case study is Bioscience High School, a public school in Phoenix, Arizona, which implemented the first student-centered participatory budgeting (PB) in the United States during the 2013-2014 academic year. PB is a democratic process of deliberation and decision-making on budget allocations. After its inception in Porto Alegre, Brazil in 1989, PB became popular throughout Brazil, spread to other countries, and currently is implemented in over 1,500 cities around the world. PB is most often applied to municipal budgets and neighborhood-scale infrastructure projects, but it has also been used in

counties, states, public housing units, schools, universities and other settings. In the U.S., the first municipal PB experiment took place in 2009 in one district of Chicago and later expanded to more Chicago districts and to other cities including New York, Boston, San Francisco, Vallejo, Long Beach, St. Louis, Rochester and San Juan (Puerto Rico). The adoption of PB has three main justifications. The first relates to political justice: people have a fundamental right to have a say in decisions that affect them. The second addresses effectiveness: when the decision-making process includes people who are affected by an issue, the quality of the decisions and their implementation tend to be better. The third is that participation is an important element of human development, as it nurtures democratic capabilities and agency among participants.

Addressing the third justification, this article examines an intervention to design and implement PB as a citizenship education program at Bioscience. The goal of the project was to create an experience through which students acquire democratic competencies by actively participating in an authentic decision-making process. The article is organized in five sections. The next section discusses models of citizenship education. Section 3 describes the participatory budgeting process at Bioscience. Section 4 presents findings about the learning acquired by students through their active involvement in PB. Section 5 provides some conclusions, makes recommendations for future practice, and suggests areas for further research. Overall, our study suggests that hands-on experience with self-governance has great potential to develop democratic knowledge, attitudes, skills and practices among students. Our findings also indicate that this potential is higher when students have the opportunity to connect these experiences to curricular and extracurricular learning activities that address democratic theories and

practices.

2. Citizenship Education

Citizenship education is expected to cultivate engaged, skilled, and knowledgeable citizens that actively participate in civic and social life in their communities. Dewey (1916) envisioned a society that fosters participation by all members, and called for educational systems to develop the interests and habits of mind to take part in creating social change. This section provides a brief discussion of the literature on citizenship education, paying particular attention to the connections between participatory democracy and citizenship learning.

2.1. Learning Democracy by Doing: Citizenship Learning and Participatory Democracy

Many democratic theorists, from Aristotle to Rousseau to Mill, Cole, and Pateman, have argued that the central function of participatory democracy is educative: the more people participate, the better able they are to participate. It is also a reinforcing process: the more people participate, the more inclined they will be to continue participating in the future (Levine, 2007; Tranter & Malone, 2008; Lopes et al., 2009; Lang, 2010). Along the same lines, Kaufman (1960), who coined the term ‘participatory democracy’, argued that its main function is not to stabilize communities, but to contribute to the development of human powers of thought, feeling, and action.

The literature on the developmental impact of participatory democracy tends to support Kaufman’s argument. In a meta-study, Berry et al. (1993) concluded that when participatory democracy provides meaningful opportunities for people to make decisions

about the allocation of goods and services in their neighborhoods, they become more knowledgeable, more tolerant, more efficacious, and more confident in government. Marshall (1993) found that direct democracy practices in village meetings in Mozambique helped participants to think together the transforming of their circumstances and themselves. In a study on women who participated in the management of neighborhood centers in Australia, Foley (1999) found that participants acquired a variety of values, worldviews, and skills, including budgeting and accounting, collective planning, and decision-making. Similar findings were reported in a study on public land management in three American Midwest communities (Halvorsen, 2003). Among other things, participants became more tolerant of different opinions, valued the inclusion of diverse viewpoints, and increased their expectations of government accountability.

2.2. Citizenship Education in Schools

In the U.S., civic education has become deemphasized as public schools shifted their focus to areas prioritized by standardized testing like reading, mathematics, and science. Moreover, teaching citizenship for testing expectations requires primary attention to information and knowledge acquisition, at the expense of the skills, attitudes, and behaviors needed to engage in democratic processes (Levine, 2006; Panah, 2010; McCowan, 2011). Indeed, whereas schools can be powerful venues for developing an engaged citizenry, participatory values and skills are typically excluded from civics courses, which often emphasize voting and personal responsibility (Palmer & Standerfer, 2004; Westheimer & Kahne, 2004; Levine, 2014). This is unfortunate, because meaningful democratic participation requires interested citizens to hold certain

competencies. For instance, participants must understand how formal procedures and concepts translate into the practice of democracy, and they need the skills to solve conflicts and communicate in deliberative settings. For this to occur, schools should prepare well-rounded citizens capable of engaging in civil, political, and problem-solving activities, both individually and collectively (McIntosh & Muñoz, 2009:6).

While the U.S. civics curriculum does not adequately groom participatory citizens, there are opportunities to nurture citizenship learning through extracurricular activities. Participation in extracurricular activities such as student councils positively impacts students' citizenship behavior as adults: they are more likely to register to vote, to be involved in political campaigns, to contact public officials, and to become members of political organizations. Interestingly, participation in other extracurricular activities such as music groups, journalism clubs, or sports teams, seems to have no effects on citizenship behavior (McFarland & Thomas, 2006; Geboers et al., 2013). In line with the reported benefits of participating in student councils, the Citizenship Educational Longitudinal Study, the largest and longest-running study about the impact of citizenship education anywhere in the world, found that one of the key factors for successful citizenship education is the presence of teachers who encourage the active participation of young people and the development of 'student voice' (Keating et al., 2010).

One strategy to encourage student participation is to integrate democratic processes into school governance. Democratic school governance that includes students in decision-making has been shown to build political efficacy among students and develop their civic knowledge (Mosher et al., 1994; Pasek et al., 2008; Schulz et al., 2010). A tradition of student participation in school affairs can be traced to Summerhill, a

democratic, self-governing school founded in 1921 in the UK that inspired the Sudbury Valley School, founded in 1968 in Massachusetts. In this tradition, self-governance requires, among other things, engaging in a process of shared learning about commonly identified issues, questions, and problems, and the development of projects around issues identified by community members. This model constitutes learning democracy by practicing democracy (Boyte & Kari, 1996; Ostrander, 2004). Additionally, experiential education theories stress that such learning can be enhanced if the experience is integrated into the academic curriculum (Colby & Ehrlich, 2000; Ostrander, 2004).

Presently, the free-democratic school movement includes hundreds of schools around the world, in which students have the freedom to organize their daily activities, and there is equality and democratic decision-making among students, teachers and staff. Many schools that provide opportunities for student voice are part of the Alternative Education Resource Organization (AERO). However, at least in the U.S., most of these schools are in the private system. Due to a set of policies, regulations and traditions, this model is less common in public schools, though there are exceptions. Bioscience High School is one of them.

2.3. Participatory Budgeting in Municipalities and Schools

Participatory budgeting (PB) is a process of deliberation and decision-making over resource allocations, typically implemented at a municipal level. Normally, this process begins with residents identifying local needs, brainstorming potential responses to these needs, and electing delegates to represent individual communities in citywide deliberations. Delegates discuss their communities' priorities and propose projects to

address these concerns. Delegates take their proposals back to the residents they represent, and then residents vote for the projects they prefer to fund. Community voting informs the delegates and city staff as they develop a final budget. The process concludes with the municipality executing the selected projects while residents monitor implementation (Baiocchi & Lerner, 2007).

PB not only yields budgetary decisions, but it also produces learning outcomes amongst participants. Recent studies on participatory budgeting and cooperative housing in Latin America and Canada found that participants learn democratic capacities, dispositions, skills and practices as a result of their participation. A key dimension is the development of agency among participants, which is related to the development of political efficacy, i.e., the confidence in one's capacity to make a difference in political processes (Schugurensky, 2004; Schugurensky et al., 2006; Lerner & Schugurensky, 2007; Panah, 2010). For this reason, participatory budgeting has been called "a school of citizenship" and "a school of democracy".

These educational outcomes make PB an intriguing tool for youth civic education. While PB is predominantly used as a tool for adults to make municipal-level decisions, there are also cases of youth PB in cities as well as in K-12 education systems. "School PB" has been practiced in schools in several countries, including Brazil, Portugal, Perú, Argentina, and France. In Brazil, School PB has been implemented in different cities, including Sao Paulo, Porto Alegre and Recife. In Recife, children are included in municipal PB in over 200 schools (Best et al., 2011). The City of Boston involved its youth in a PB process in 2014 that allocated \$1 million of the City's capital budget. The City organized a Mayor's Youth Council to govern a process in which 1,500 participants

age 12-25 voted on 14 projects (City of Boston, 2014; Levine, 2014). The Région Poitou-Charentes in France implemented School PB in 93 public high schools, allowing students to determine priorities for a portion of the school budget, sometimes by themselves, and sometimes as part of a larger process that also includes parents, teachers and employees (Röcke, 2014). At Ridgeview Elementary School in West Vancouver, Canada, a teacher organized a PB process in 2005 with support from the school's Parent Advisory Council (Participatory Budgeting Project, 2014). Despite evidence of PB's contribution to citizenship education and the record of youth and School PB around the world, there had been no School PB initiative in the U.S. until the Bioscience project in 2013-2014. In 2015, Overfelt High School in California became the second school in the USA to implement a PB process.

3. The Study: Participatory Budgeting at Bioscience High School

In the academic year 2013-14, Bioscience implemented the first School PB process in the U.S. The goal was to develop in students some of the competencies necessary to actively engage in public debates and democratic decision-making processes. This section describes the research methods employed in the study as well as the school PB process from its inception through its completion.

3.1. Research Design

PB was introduced to Bioscience by this article's lead author, who engaged in participatory action research, employed direct observation, interviewed students, distributed pre- and post-questionnaires, and mentored the student steering committee

(described in Section 3.3). To explore the learning and change experienced by participating students, we adopted an instrument designed by Schugurensky (2002; 2006) and applied in several studies on informal democratic learning (Schugurensky et al., 2006; Lerner & Schugurensky, 2007; Schugurensky & Myers, 2008). Those studies explored the contribution of participation in democratic processes to the development of democratic competencies, dispositions and practices. The instrument consists of 55 indicators of learning and change organized into four categories: knowledge, attitudes, skills, and practices (KASP). For this study, we selected 20 indicators that best represented potential learning outcomes in a U.S. high school. We then adapted the wording of the indicators (which were originally developed for municipal PB processes) to be relevant to a school context.

When students voted at the end of the School PB process, they were invited to fill out a questionnaire that assessed their competency development. The questionnaire asked students to rate themselves pre- and post-PB on a scale of one to five (1=low; 5=high) for the 20 selected indicators. We calculated the mean student rating for each indicator and compared pre- and post-means to determine the mean change for each indicator. We then tested for randomness through a paired samples *t*-test. We compared results for all students and also sorted data by grade level and other factors.

3.2. Bioscience High School

Bioscience High School is a STEM (science, technology, engineering, and math) specialty school in the Phoenix Union High School District. Located in downtown Phoenix, Arizona, Bioscience had 285 students at the end of the 2013-14 school year.

The student body comprises diverse socioeconomic backgrounds: the student population is over 62% Hispanic, and roughly two-thirds of students qualify for the District's Free and Reduced Meals program. Bioscience teachers emphasize project-based, student-centered learning through exploration and inquiry (Kay et al., 2014). This atmosphere offered an advantageous environment for testing School PB because administrators, teachers, and students were already accustomed to experiential learning.

3.3. Overview of the Process

To initiate PB at Bioscience, the lead researcher first met with and received support from the school's principal, who pledged \$2,000 from his personal administrative budget. The principal then connected the researcher to the Student Government (STUGO) teacher-mentor hoping that PB would become a signature STUGO project. Then, the researcher met with STUGO's eight-member board to ensure student buy-in and establish the project as student-driven. At that meeting, the researcher explained the basic rules of engagement: (1) students would allocate \$2,000, (2) the funds could not be used for direct money or gifts, (3) the funds had to be used to benefit students, the school, or community, and (4) STUGO would help guide the process but have no decision-making authority. The entire student population, through a voting procedure, would be responsible for making the final decision.

The STUGO board was excited about the project and decided to organize a steering committee to design the participatory process. The board decided that the PB steering committee would be comprised of the eight STUGO board members and eight representatives from the student body (two students from each grade level). From the

start, it was clear that the students were both shocked that their principal would entrust them with what was to them a large sum of money and motivated to make good use of those funds. It also became clear that it would be challenging for students to govern a participatory process when they were not raised in a culture that valued direct participation in decision-making. Some board members had trouble accepting that the steering committee should be selected through a democratic process. Two board members thought the board should hand-select the committee to make sure that they get “serious” students. Another board member, a male sophomore responded, “if this is about democracy, then shouldn’t we let them vote?” The tension between appointed and elected representatives, as well as the tension between representative and participatory decision-making, would arise throughout the process.

At a subsequent meeting, the STUGO board set the process for forming the steering committee. They decided to introduce PB and the steering committee to the student body at a school-wide assembly. STUGO representatives would then run steering committee elections at each grade level. To prepare for the assembly, two female junior students drafted a speech with one of their teachers. One of the students delivered the speech at the assembly, which was attended by the majority of students.

Bioscience’s size and structure facilitated grade-level nominations. Each grade is small, ranging from roughly 50 to 100 students. Also, teachers at Bioscience team-teach, and each grade has a large common area. Following the assembly, each grade level held a meeting to nominate potential steering committee members. STUGO board members led the nomination process, which required that a student be nominated and each nomination be seconded. STUGO recorded all nominees and created a ballot for each

grade. The next day, each grade elected two students to represent them on the steering committee.

The initial steering committee consisted of 16 students: the eight STUGO board members and two representatives from each grade level. Over the course of the project, 12 of the 16 steering committee members engaged regularly, as four students were unable to maintain their commitment. The steering committee met weekly with guidance from the STUGO teacher-mentor and the researcher. From the beginning it was explained to the students that this was their project and that the adults would only assist or intervene if needed. The steering committee began by setting ground rules for itself, which included drafting a charter, rules of order, and a project timeline.

The steering committee designed the process through which the student body would participate in budgeting. The committee created a project proposal form, and the grade level representatives distributed the applications to their peers in class. The experience at each grade level was unique. The freshman teachers created class time for students to discuss potential projects, talk to their steering committee representatives, research project budgets, and complete project forms. At the sophomore level, little in-class time was devoted to PB, and the junior and senior grade levels fell in the middle of this spectrum.

3.4. Proposed Projects and Decision-making

A total of 45 students collaborated on 32 proposal submissions, totaling \$15,462.14. During the initial review of project proposals, the steering committee eliminated seven proposals that were incomplete, were unfeasible, or proposed a service

that the school already offered for free. Of the 25 approved proposals, 15 requested funding for recreational purposes, seven proposed facilities improvements, and three were for academic purposes. The steering committee reviewed the proposals a second time to consolidate redundant projects and settled on 18 final projects on which the student body would deliberate and vote. Table 1 lists the final 18 projects and their budgets.

Table 1: Projects proposed by students and budget

Proposed Projects and Descriptions	Budget
*Bioscience outdoor pavilion - Education display in school's courtyard	\$1,510.00
*Ink for the 3D printer - Color ink spools for the school's 3D printer	\$266.00
*Microscope camera adapter - Attaches digital camera to microscopes	\$763.20
ROTC program - Start-up funding to create an ROTC program	\$2,000.00
School garden - Large scale garden in front of school	\$217.16
More recycling bins - Increase number of recycling bins in Town Hall	\$150.00
Power outlet extension - For students to charge laptops in class rooms	\$150.00
Big umbrellas - Nine shade umbrellas for tables in school's courtyard	\$740.00
Shade for outside area - A triangle shade structure for school's courtyard	\$129.00
Sports equipment – Basketball hoop and assorted sports balls	\$555.00
Music Club - Instruments for a new music club	\$999.97
Fun Swings - Swing for school campus	\$149.99
Gaga pit - Build a court for students to play the game 'gaga'	\$500.00
New basketball hoop and backboard – For the school's courtyard	\$263.04
Volleyball equipment - To set up a second volleyball court on campus	\$157.99
Soccer goal - Two small goals for students to play during lunch	\$169.88
Painted basketball court - Latex paint to mark a basketball court	\$36.44
Scents, glowing plants, and fence of love - Modeled after fence in Paris	\$203.20

*Winning projects from the final student vote

The steering committee spent the next week creating promotional materials to educate their peers about the proposed projects. They created a poster for each project that included the project title, a brief description, and the total budget. The steering committee hung the posters in Town Hall, the school's cafeteria, a multifunctional area that also functions as entry hall and assembly space. They also posted project descriptions on the school's internal social media site. Each grade level held a forum for the steering committee to present the projects and allow the students to ask questions and discuss the merits and shortcomings of each project. At the freshman grade level, teachers helped structure a format in which the students debated and collectively identified their top three projects. At the other grade levels, the teachers were not involved, and the steering committee representatives led less formal discussions.

A few days after the forums, teachers allocated class time for the final vote, and the steering committee distributed ballots to all students. Students were asked to rank their three favorite projects. Later, the representatives for each grade level tallied their peers' votes and weighted the results by their first, second, and third place rankings. The three most popular projects were the Bioscience Outdoor Pavilion (BOP), ink for the 3D printer, and the microscope camera adapters. BOP and the ink for the 3D printer were directly tied to student projects from the school's project-based curriculum, and the microscope camera adapters were intended for use in school science classes. These three projects slightly exceeded the \$2,000 budget, but the principal was so pleased to learn that students voted to support academic pursuits that he decided to fund all three projects.

The School PB process ended in May 2014. As Bioscience was nearing the end of the academic year, plans were made to implement the projects when students returned

from summer vacation. The school community was pleased with the process and its outcomes. The underclassmen on the steering committee all expressed interest in participating again, and the principal committed to supporting a second round of PB the following year. The process was refined and implemented again in the 2014-15 school year.

4. Findings

Because PB was conceived as a citizenship education program, we collected data from students to explore whether the process contributed to the development of democratic competencies and attitudes. This section presents first students' motivations for participating in the activity and then their learning and change.

4.1. Motivation to Participate

The PB experiment at Bioscience was guided by the premise that students would learn basic democratic competencies by participating in an authentic participatory process. A precondition for the implementation of this process is that students actually show interest and participate in the experience. Nearly all students at Bioscience participated in the PB program, and they reported diverse motivations for their willingness to participate

Part of PB's effectiveness as a learning tool was its ability to motivate students to participate in an informal learning process. While students offhandedly marveled that they were trusted to spend their principal's money, they identified other reasons for their participation. Almost two thirds of responding students reported that either they wanted

to have a voice in their school (44%) or wanted to participate in a collective decision-making process (18%), 20% wanted to improve their school community, and 12% were motivated by a specific issue. A smaller percentage of students stated that they participated because they were motivated by the money to be allocated or because they were given the opportunity. Table 2 presents the reasons given by students to participate in the school PB, and a few examples that illustrate those reasons.

Table 2: Students' Reasons for Participating in the PB Program (n=61)

Reason	Percent of Responses	Examples of Student Comments
Wanted a say in the investments	44%	<p>"I thought it would be great if I could have a voice that could benefit my school (Freshman Female)"</p> <p>"I wanted a say in what happens in the school I am attending. If I don't say something I can't complain (Freshman Male)"</p> <p>"I'd like to have a say in what happens at my school (Senior Female)"</p>
Motivated by the collective decision-making process	18%	<p>"It was cool to see the money spent in a smart fashion (Sophomore Male)"</p> <p>I like the idea of this because everyone participates (Freshman Female)"</p>
Wanted to improve school	20%	<p>"I wanted to help out the school (Freshman Male)"</p> <p>"I think it's fun to be able to have a positive impact on our [school] (Senior Female)"</p>
Motivated by an issue	12%	<p>"I thought the basketball courts could be updated (Freshman Male)"</p> <p>"Because I want a school garden (Freshman Female)"</p>
Were given an opportunity	3%	<p>"Because I was given the opportunity to do so (Junior Male)"</p>
Motivated by the money	3%	<p>"\$2000 is a lot of money and I wanted to be involved in the final decision (Freshman Male)"</p> <p>"Because we've never had the opportunity to spend that much money before (Sophomore Female)"</p>

4.2. Learning and Change

A questionnaire was distributed to all students with the final project ballot. A total of 217 students from the four grade levels (86 freshmen, 50 sophomores, 42 juniors, and 39 seniors) responded to the questionnaire. Students were asked to rank themselves pre- and post-PB for 20 indicators of democratic participation. Table 3 presents the questionnaire results aggregated across all grade levels. The table shows the pre- and post-PB means for each indicator as well as the mean change. Indicators of learning and change are organized in four domains: knowledge, attitudes, skills and practices.

Table 3: Changes in KASP among Bioscience Students

Student Questionnaire Results for All Grade Levels (n=217)

Indicator	Pre-Process Mean	Post-Process Mean	Mean Change*	<i>t</i>	df
Knowledge					
needs of classmates	2.90 (.93)	3.75 (.84)	.85 (.93)	13.50	215
needs of other grade levels	2.15 (1.00)	3.05 (1.11)	.90 (1.01)	13.13	215
how decisions are made at school	3.02 (1.15)	3.95 (.93)	.93 (1.12)	12.21	215
Attitudes					
self-confidence	3.39 (1.22)	3.77 (1.09)	.38 (.78)	7.03	213
tolerance and respect for others	3.88 (1.06)	4.17 (.89)	.29 (.69)	6.03	213
trust in school administration	3.56 (1.06)	3.88 (.98)	.32 (.77)	6.04	213
confidence in own ability to influence school decisions	3.03 (1.17)	3.51 (1.13)	.48 (.80)	8.83	213
interest in community participation	3.37 (1.22)	3.86 (1.10)	.49 (.81)	8.69	213
concern for school community	3.36 (1.13)	3.87 (1.06)	.51 (.81)	9.07	213
Skills					
public speaking	3.15 (1.35)	3.72 (1.08)	.57 (.92)	9.07	212
listening carefully to others	3.72 (1.11)	4.18 (.83)	.46 (.80)	8.34	213

proposal development and persuasion	3.06 (1.18)	3.53 (1.10)	.47 (.79)	8.60	213
teamwork and cooperation	3.69 (1.07)	4.17 (.84)	.48 (.91)	7.69	213
conflict resolution	3.31 (1.12)	3.79 (.96)	.48 (.85)	8.29	213
decision-making with peers	3.45 (1.11)	4.00 (.93)	.55 (.89)	9.03	213
leadership and group coordination	3.20 (1.25)	3.69 (1.12)	.49 (.93)	7.66	213
Practices					
talk with classmates about problems at school	3.22 (1.23)	3.85 (1.02)	.63 (.95)	9.84	215
think up ideas and solutions to these problems	2.74 (1.11)	3.43 (1.06)	.69 (.89)	11.52	215
propose these ideas and solutions to others	2.40 (1.13)	3.15 (1.12)	.75 (.98)	11.33	214
talk to the principal and other school administrators	1.96 (1.17)	2.42 (1.29)	.46 (.84)	8.14	214

Notes: * $p < 0.01$. Standard Deviations appear in parentheses after the means

While the mean changes across all indicators are net positive, we only consider indicators for which students identify a mean change of at least 0.50 points as positive growth. Through this lens, the findings presented in Table 2 show that students reported the most significant changes in indicators pertaining to knowledge and practices, and smaller changes regarding attitudes. Changes in civic and democratic skills fell somewhere in between. The greater change in knowledge and practices is logical, as students altered their practices to participate in PB, and the process prompted them to learn about issues in their school. The reasons to explain the smaller changes in attitudes and skills are less clear, but it is possible to argue that a longer and more involved experience might be necessary to significantly alter someone's values. Regarding skills, the highest reported growth could be observed in the areas of decision-making with peers and public speaking. Improvement in skills related to teamwork and leadership were more noticeable among the 16 members of the steering committee, who had more regular meetings than the rest of the students.

We analyzed the data using different variables, including gender, level of participation and grade level. Gender did not show any measurable impact on the results. Level of participation, contrary to our expectations, had little effect as well: students that participated in every opportunity did not report much more growth than students that participated minimally. We anticipated that the steering committee members would report the most growth, but because these students tended to rate themselves very high pre-process, they left little room to report growth. It is indeed possible that STUGO students and those who joined the steering committee as grade representatives already had above average experience in democratic processes. Interestingly, the variable that

accounted for the most noticeable discrepancies in the results was grade level. Table 4 presents the results by grade level.

Table 4: Changes in KASP by Grade Level

Indicator	Grade Level											
	Freshman (n=86)			Sophomore (n=50)			Junior (n=42)			Senior (n=39)		
	Mean Change	<i>t</i>	df	Mean Change	<i>t</i>	df	Mean Change	<i>t</i>	df	Mean Change	<i>t</i>	df
Knowledge												
needs of classmates	.92** (1.01)	8.44	85	.72** (.73)	6.70	49	1.07** (1.05)	6.64	41	.62** (.75)	5.10	37
needs of other grade levels	.89** (1.00)	8.29	85	.74** (.80)	6.51	49	1.15** (1.31)	5.72	41	.84** (.86)	6.07	37
how decisions are made at school	1.16** (1.34)	7.98	85	.90** (1.02)	6.27	49	.83** (.96)	5.62	41	.58** (.72)	4.95	37
Attitudes												
self-confidence	.53** (.89)	5.52	85	.26* (.69)	2.65	49	.29* (.81)	2.28	38	.26** (.50)	3.21	38
tolerance and respect for others	.39** (.78)	4.65	85	.18* (.56)	2.27	49	.28* (.76)	2.32	38	.18* (.51)	2.21	38
trust in school administration	.49** (.86)	5.31	85	.18* (.56)	2.27	49	.18 (.94)	1.19	38	.24** (.48)	3.14	38
confidence in own ability to influence school decisions	.62** (.84)	6.78	85	.36** (.56)	4.52	49	.33* (.81)	2.58	38	.49** (.91)	3.33	38
interest in community participation	.63** (.88)	6.60	85	.37** (.72)	3.63	49	.44** (.85)	3.20	38	.36** (.71)	3.17	38

concern for school community	.72** (.90)	7.40	85	.41** (.70)	4.16	49	.47** (.91)	3.26	38	.18* (.45)	2.48	38
Skills												
public speaking	.76** (1.11)	6.31	84	.48** (.74)	4.62	49	.47** (.83)	3.55	38	.37** (.67)	3.49	38
listening carefully to others	.58** (.87)	6.17	85	.40** (.78)	3.62	49	.49** (.88)	3.44	38	.23** (.48)	2.97	38
proposal development and persuasion	.64** (.87)	6.82	85	.36** (.53)	4.85	49	.36** (.81)	2.77	38	.31* (.80)	2.40	38
teamwork and cooperation	.63** (1.13)	5.22	85	.36** (.69)	3.67	49	.46** (.82)	3.51	38	.29** (.60)	3.05	38
conflict resolution	.66** (.94)	6.46	85	.46** (.91)	3.58	49	.37** (.78)	3.00	38	.23** (.48)	2.97	38
decision-making with peers	.73** (1.05)	6.50	85	.36** (.75)	3.40	49	.62** (.81)	4.72	38	.31** (.61)	3.13	38
leadership and group coordination	.54** (1.08)	4.63	85	.42** (.78)	3.78	49	.56** (.91)	3.86	38	.37** (.74)	3.13	38
Practices												
talk with classmates about problems at school	.95** (1.07)	8.23	85	.59** (.91)	4.55	48	.33* (.85)	2.55	41	.32** (.52)	3.86	38
think up ideas and solutions to these problems	.90** (.98)	8.51	85	.61** (.81)	5.28	48	.57** (.89)	4.17	41	.49** (.68)	4.45	38

propose these ideas and solutions to others	.91** (1.00)	8.37	85	.63** (.91)	4.74	47	.83** (1.15)	4.71	41	.51** (.76)	4.23	38
talk to the principal and other school administrators	.58** (.94)	5.74	85	.38** (.73)	3.55	47	.57** (.97)	3.81	41	.21** (.41)	3.13	38

Notes: * $p < 0.05$; ** $p < 0.01$. Standard Deviations appear in parentheses after the means

As can be observed in Table 4, freshman students reported the highest impact, while sophomores and seniors reported the lowest impact. The limited growth experienced by seniors can be explained by the timing of the process. Most of the PB activities occurred towards the end of the school year, when seniors were preparing to graduate. To be sure, seniors expressed interest in their school's legacy, and during a grade-level forum they discussed the importance of projects that focused on education to strengthen learning experiences for future students. At the same time, they admitted that they were more focused on graduating and preparing for college. One female senior student suggested that in the future PB would need to take place during the first semester to gain full buy-in from the senior class. Although they valued PB, seniors knew that the outcome would not impact them. This may explain why seniors engaged less than other grade levels.

The case of the freshman students is interesting, and provides an important lesson for school participatory budgeting processes: formal, in-class learning opportunities can contribute significantly to maximize the informal learning acquired by students through PB. This was indeed the case of freshman students. Earlier in the year, the freshman teachers conducted a weeklong governance unit. Throughout that week, freshman students 'lived' and examined the spectrum of governance -from authoritarian to participatory-, with classrooms operating under a different governance structure each day. At the end of the week, students organized, led, and participated in a forum to redesign their grade's tutoring program. Freshman teachers also helped their student steering committee representatives plan engagements, allocated class time for engagements, and

made PB an explicit priority to their students. During in-class forums, freshman teachers engaged with their students and stressed the importance of the decision-making process.

As importantly, these teachers also related the students' experience with PB back to the governance unit, encouraging individual and collective reflections on their experiential learning. This was a crucial piece in the learning process of freshman students, and confirms the value of connecting formal and informal settings to nurture the development of certain competencies, and the importance of reflection in experiential learning (Dewey, 1938; Kolb, 1983; Daudelin, 1997; Barth et al., 2010; Pearson & Smith, 2013). At this point, it is pertinent to ask why the freshman teachers were more eager to connect the PB process to the curriculum than other teachers. It is our hypothesis that the answer to this question lies in the fact that the original impetus for PB at Bioscience originated from a conversation between the lead researcher and a freshman teacher. From our perspective, this can explain why there was greater buy-in from the entire freshman teaching team, and why freshman teachers made more time for PB in their classrooms than other grade levels.

5. Conclusions

The experience of Bioscience High School strongly suggests that School PB is a promising tool for citizenship education and for developing engaged citizens. Our findings show that there was positive growth across most competency indicators. At the same time, significant gains in student learning were not evenly distributed across the four competency domains (knowledge, attitudes, skills, and practices) or grade levels. Overall, PB at Bioscience predominantly occurred in an informal process with little

connection to classroom activities. The freshman grade level was the one exception in which PB was tied to classroom learning. First, the high level of teacher involvement paired with significant freshman student learning supports the assertion by Keating et al. (2010) that the presence of teachers encouraging student participation is one of the biggest success factors in citizenship education. Examining the freshman case, it becomes clear that connecting extracurricular PB processes to classroom learning presents an opportunity to further strengthen School PB as an educative tool.

The contribution of this project to the promotion of civic learning underscores the importance of the school context. For School PB to be successful, school leadership must be supportive, as was the principal and student government mentor at Bioscience. Also, Bioscience features a flexible curriculum and schedule, which enabled the steering committee to secure class time to engage with their peers. The model described here may have to be adapted for a school with a more traditional class-period format. Student background and training also played a large role in the success of this project. As experiential learning was already a key element of Bioscience's curriculum, students were primed to participate in and learn through a nontraditional project. In other settings, more attention may need to be paid to steering committee structure and to the school's club protocols.

PB at Bioscience was a successful project, but it was not perfect. Some shortcomings of this process can be attributed to design. In this regard, the experience of this project generates three additional recommendations for designing future School PB processes:

1) Provide up-front capacity building: As the School PB process begins, it might be useful to discuss the background and justification of PB with students. This moment also provides an opportunity to teach about direct democracy, its importance, and the skills needed to participate at the local level.

2) Conduct a longer process: This project was implemented over an eight-week period at the end of the school year. A robust School PB process will require more time to maximize student learning. A longer process can provide more opportunity to build steering committee capacity to ensure the students design a meaningful process for their peers. A longer process also can provide the opportunity to build multiple forms of engagement into the schedule and to increase the level of student engagement.

3) Include educational programming for formal settings: It is easier to approach PB as an extra-curricular activity managed through student clubs than it is to gain class time from teachers. However, teacher buy-in is important, and as discussed above, pairing PB's informal educational experience with formal classroom education can improve student competency acquisition.

Future research should address two issues. The first relates to the medium and long-term impact of School PB, beyond the school setting. In other words, to what extent do students carry the learning and change acquired through School PB to civic life outside the specific context of School PB? Are they more likely to engage in other areas of school governance? Are they more respectful and open to other people's opinions inside and outside school? Are they more likely to participate in student government in college, to participate in democratic institutions in their communities, or to contribute to the democratization of their workplaces? Are they more likely to vote or to run for

office? Are they more confident and able to engage in deliberative and decision-making processes? Further research is needed to ascertain if students increase their agency and their capacity to participate outside of school and in processes other than budgeting. Furthermore, longitudinal studies can help to understand the changes experienced by high school students after four years of School PB (e.g. following a cohort from Grade 9 to Grade 12) and after graduation.

The second issue relates to the relevance of our findings to non-U.S. settings. There are many nations around the world that are both more and less participatory than the U.S. There are also states where popular participation in decision-making does not exist. Also citizens in different locations experience varying development needs and have widely variable education levels. To what extent does this experience provide meaningful strategies to researchers and educators working in different contexts?

In closing, K-12 schools provide a powerful venue for citizenship education, and PB may be used to help students acquire some of the competencies required of engaged citizens. The case study of Bioscience High School suggests that School PB can add an effective dimension of experiential learning to the citizenship education curriculum. The lessons from this pilot experiment can be applied to future School PB projects to further strengthen student learning and solidify PB as a valid educational tool.

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