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Ready for the Future

The Role of Performance Assessments in Shaping Graduates' Academic, Professional, and Personal Lives

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Abstract

The perspectives of graduates offer a valuable source of understanding for educators and policy-makers on how to ensure high quality educational pathways that prepare all students for work and college. Based on in-depth interviews with graduates from three Boston Public Schools with well-established performance-based assessment systems, the study analyzes graduates' preparation for future academic, professional, and personal endeavors. First, graduates describe the process of learning from performance assessment, defined as assignments that measure how a student uses knowledge and complex skills to create or refine an original product using multiple steps over time. Next, they reflect on the ways their learning prepared them for future schooling or work and the areas in which they faced challenges. Overall, despite a few challenge areas, graduates who were interviewed say the study schools' performance assessment systems contributed to their success in college and in the world of work. Performance assessments helped students who participated in the study to discover their own learning styles, to learn academic content and skills, and to develop critical thinking, communication, and real world skills.

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Introduction to the Role of Performance Assessments in Shaping Graduates' Academic, Professional, and Personal Lives

You can't learn everything in a book. We had many different types of learning. We'd read a book but then we'd do a lot of different projects. We'd have to go and research stuff on our own, and then we'd set up some kind of major activity involving that.…[Schools] need to figure out different techniques of education, because some people learn better visually and some people learn better hands-on, and some people learn better just listening. I think Fenway did that pretty well.
—*Aaron[1], Fenway Graduate*

The perspectives of graduates offer a valuable source for understanding how to improve access to high quality educational pathways for all students. Based on analysis of in-depth interviews with graduates from three Boston public schools with well-established performance-based assessment systems, this study aims to better understand graduates' preparation for future academic, professional, and personal endeavors. Though students also take state tests and other types of assessments at the schools, assessment of student learning is structured around performance assessments designed to measure how a student uses knowledge and complex skills to create or refine an original product using multiple steps over time. Graduates describe how they learned, the ways their learning prepared them for college or work, and the areas in which they faced challenges. Overall, graduates in our sample say the study schools' performance assessment systems, which were situated within a supportive school culture, contributed to their success in college and in the world of work. Performance assessments helped study participants to discover their own learning styles and interests, to master academic content and skills, and to develop critical thinking, communication, and real world skills. Despite a few challenge areas, the benefits of performance assessment learning offer important lessons for all those who aim to improve the educational experience for students.

After a brief review of literature about assessment and school reform, and a description of the study design, we present and discuss findings related to students' experiences of each school's culture and performance assessment. Studying performance assessment quality, implementation, and effects on students contributes valuable information to educators and policy-makers about the learning experiences that play a role in graduates' success in college and in their careers. Additionally, the findings can provide schools with ideas for improving their approach to assessing student learning.

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[1] All names of study participants have been changed to pseudonyms.

Graduate Stories in the Landscape of Assessment and School Reform Research

The perspectives of graduates on their own education, and on how it has prepared them for their future endeavors, provide new data about the value of performance assessment. Together with other kinds of research on performance assessment and effective school reform, this study will help policy-makers to make informed decisions about the place of performance assessment in public education.

The use of performance assessment is grounded in the philosophy of authentic assessment as an effective approach to fostering student learning through experience and doing, and the terms are often used interchangeably. Newmann and Wehlage's (1995) research on successful school restructuring efforts revealed the value of authentic student achievement. They developed a definition of authentic assessment with three criteria: construction of knowledge, use of disciplined inquiry, and value beyond school. Construction of knowledge means that students build on prior knowledge by organizing, synthesizing, interpreting, or explaining information through original writing, conversation, or performance rather than simply reproducing knowledge. Disciplined inquiry means that from a base of knowledge, students try to understand a problem deeply and to communicate their ideas and findings. Value beyond school means the product of authentic work has aesthetic, utilitarian, or personal value in addition to assessing the learner's knowledge. Box A provides an illustration of these criteria.

Though many variations exist in practice, an accepted academic definition of performance assessment is "product- and behavior-based measurements based on settings designed to emulate real-life contexts or conditions in which specific

> *Box A.* **An Example of Authentic Achievement and Its Place in Schools**
>
> Newmann and Wehlage offer the task of designing a bridge to illustrate the intellectual qualities of authentic achievement.
>
> ***Construction of Knowledge***: New knowledge is produced as specific conditions such as the span of the bridge or environmental conditions are addressed in the bridge design.
>
> ***Disciplined Inquiry***: Existing bodies of reliable knowledge and procedures in fields such as engineering and architecture help address the basic problems of bridge design.
>
> ***Value Beyond School***: The bridge will be safe and useful to travelers. Hopefully, it will also be pleasing to the eye and be a source of pride to the designers and builders.
>
> Students need time to build a foundation of skills and knowledge for authentic performance. While it is unrealistic to expect that every activity in school will always have all three criteria, schools can keep authentic achievement clearly in view as the ideal, valued end.

knowledge or skills are actually applied" (American Educational Research Association, American Psychological Association, & National Council on Measurement in Education, 1999). Performance assessment tasks vary in their purpose, the conditions under which they are administered, and the products students create. In general, however, performance assessments require students to create an original answer or product, use higher order thinking and 21st century skills[2], demonstrate thought processes, and evaluate real world situations.

Many educational researchers have described and analyzed the benefits of performance assessments. From the perspective of pedagogy, performance assessments accommodate a wider variety of learning styles and encourage collaborative practices among teachers (Darling-Hammond & Pecheone, 2009; Darling-Hammond & Wood, 2008; Niemi, Baker, & Sylvester, 2007). Performance assessments can also measure deeper, more complex content knowledge and higher-order thinking, writing, and problem-solving skills than fixed-response assessments (ibid.). Some researchers have also found evidence that performance assessments reduce ethnic differences in test scores and college admissions when compared to the achievement gaps on traditional standardized tests (Stemler, Sternberg, Grigorenko, Jarvin, & Sharpes, 2009).

In the late 1980s and early 1990s, researchers and school reformers at the Coalition of Essential Schools (CES) and the National Center for Restructuring Education, Schools and Teaching (NCREST) at Teachers College in New York promoted authentic assessment as an alternative to, and in some cases a replacement for, traditional standardized testing (Darling-Hammond, Ancess, Falk, & Columbia University. Teachers College. National Center for Restructuring Education Schools and Teaching., 1995; Wiggins, 1989, 1993). At the peak of the movement in the mid-90s, the National Assessment of Educational Progress (NAEP) changed to reflect more authentic approaches to assessment (Haertl & Mullis, 1996). At that time, at least a dozen states were experimenting with including some sort of authentic or performance-based assessment in state requirements (Baron & Wolf, 1996).

Efforts at performance assessment were sometimes muddled, however, as they were part of a reform and restructuring movement that often gave too much attention to changes in school organization while not directly addressing the quality of student learning (Newmann & Wehlage, 1995). As a result, when school restructuring did not always deliver improvements in student learning, concerns were also raised about the viability of performance assessments. Additionally, though some have documented the attainment of technical quality (reliability and validity) (Foote, 2007), here have been challenges in

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[2] 21st century skills is the term used for skills that matter in the 21st century, taking into account the global economy, technology, and changing workforce requirements. These skills include learning and innovation skills such as critical thinking, communication, collaboration, and creativity; information, media and technology skills; and life and career skills such as adaptability, cross-cultural skills, initiative, leadership, and responsibility (Partnership for 21st Century Skills 2008).

attaining technical quality on state performance assessments, especially early in the implementation (Gong & Reidy, 1996; Koretz, Stecher, Klein, & McCaffrey, 1994). These challenges contributed to a renewed emphasis on standardized testing and a departure from using authentic assessment for school accountability in the late 1990s (Koretz, 1998).

Interest in performance assessment has returned in the wake of the challenges related to the implementation of No Child Left Behind (NCLB). The legislation calls for multiple measures, but in reality, implementation of NCLB accountability systems in the U.S. has resulted in a narrow range of measures focused on large-scale testing (DePascale, 2009). Performance assessments have the potential to be a powerful component of a school accountability system that includes multiple measures of student performance. Thus, student data, in the form of in-depth reflection, about the value of performance assessment learning is especially relevant as assessment and accountability in public education gain attention at the federal, state, and local levels. Moreover, this data is useful as policy-makers weigh the costs and benefits and anticipate potential unintended consequences of different accountability options.

Study Design[3]

This is the first study to use retrospective graduate interviews to better understand performance assessment, though a number of studies have used graduate interviews to learn retrospectively about the effects of different educational experiences (Bensman, 2000; Chamberlin, Chamberlin, Drought, & Scott, 1942; Eaton, 2001). Despite that students' perspectives on education affect student learning, researchers and practitioners who make decisions about what and how students learn rarely ask students about their experiences in schools (Kushman & Shanessey, 1997). Graduate perceptions of how performance assessments affected them in the short and long term provide first-hand data about student learning and how that learning affected their future endeavors. Graduate data can help educators and policy-makers evaluate the effectiveness of educational approaches and learn lessons to inform reform efforts.

The following research questions guided our data collection and analysis.

- What are graduates' recollections of and perspectives on school experiences?
- What role did performance assessments play in graduates' learning at their school?
- To what extent did performance assessments prepare graduates in their academic and work experiences after leaving the school?

Our main interest lies in learning more about how public education can best meet the needs of all children. These questions enable us to gain a better understanding of both the overall

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[3] A fuller description of the methods used in this study can be found in Appendix A.

educational experience provided by these schools and the phenomenon of learning through performance assessment.

We used in-depth interviewing techniques and qualitative methods to understand the process and types of learning from performance assessment. Using a snowball sampling method, we identified graduates to interview. The semi-structured interview protocol (see Appendix B) used mainly open-ended questions that gave participants the opportunity to reflect, qualify, and fully explain themselves. This approach allowed us to consider multiple aspects of the educational experience from the perspectives of students and probe learning processes and the meaning people attach to their own experiences.

Site Selection

Three sites provide a point of comparison for analyzing whether performance assessment experiences are common across sites or exclusive to a specific site. Boston Arts Academy (grades 9-12), Fenway High School (grades 9-12), and Mission Hill School (grades K-8) all have performance assessment systems experienced by multiple cohorts of graduates.[4] Though there may have been some changes over time, the structures and basic requirements of the performance assessments at each school have been relatively consistent.

We include two high schools because of the importance of high schools in preparing students for post-secondary education and the work place. Boston Arts Academy adds the dimension of specialization at the high school level through the combination of arts education with academics. Including a K-8 school allows us to examine the value of performance assessments at a younger age.

Each school has a performance assessment system tailored to its own mission. All three performance assessment systems include portfolios and exhibitions and are used to make high-stakes decisions about grade promotion and graduation. Portfolios are collections of student work which show a student's efforts, progress, and achievements. Exhibitions require a student to publicly demonstrate his or her knowledge and/or progress, often for an outside audience. Whether in writing (such as in portfolio reflections) or orally through presentation and dialogue (such as during a portfolio defense or exhibition of a culminating project), students must explain and defend their understanding and analysis of the topic. Chart A outlines the structure and terminology of the assessment systems at each school.

Boston Arts Academy (BAA) (grades 9-12)

The Boston Arts Academy assessment system requires students to demonstrate their skills and knowledge through portfolios, exhibitions, and performances in both academics and an

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[4] Students at Mission Hill School who complete the Graduation Portfolio requirements graduate 8th grade with a Mission Hill School diploma. Occasionally, a student who does not pass all of his or her Graduation Portfolios can be still promoted to high school without a Mission Hill School diploma.

Chart A. Summary of Performance Assessment Systems			
	Boston Arts Academy	Fenway	Mission Hill
Class Portfolios	• RICO Review (cross-subject by term) • Arts Portfolios	• By subject (humanities, math, science) for each term	• In preparation for Graduation Portfolios
Exhibitions	• Academic & Arts Exhibitions • Performances in Arts Major	• Science Fair • Math Exhibitions	• In preparation for Graduation Portfolios
Graduation Requirements	• Benchmark Requirements • Senior Project Grant Proposal	• Junior Review • Senior Graduation Portfolios (Subjects & Ventures Internship)	• 6 Graduation Portfolios with Exhibitions & Defenses

artistic discipline. Class portfolios, called RICO Reviews, require students to reflect on how different pieces of their work demonstrate the RICO (Refine, Invent, Connect, Own) Habits of the Graduate.[5] Benchmark requirements, including a junior year Humanities 3 research paper and a senior humanities group project, are milestones that represent a specific skill or knowledge required for graduation. The culminating performance assessment is the Senior Grant Proposal which requires students to synthesize knowledge and skills from the arts and academic curricula to create a program that addresses a real community need. Grant review panels of outside community members judge both written and oral presentations, and finalists are awarded grant money to execute their projects.

Fenway High School (grades 9-12)
At Fenway High School, at all grade levels, portfolios and exhibitions in required subjects prepare students for more demanding performance assessments at the end of junior year and in senior year. In the Junior Review, which emphasizes personal growth and reflection, students present work from their first three years in order to prove they are prepared to be seniors. Senior Portfolios focus on academic content and the application of knowledge. Students demonstrate their mastery of competencies in math, humanities, and science. The senior humanities portfolio typically includes about ten different pieces, ranging from a research and teaching project to an interdisciplinary piece, all on a topic of the student's choice. In the Ventures program, where seniors complete an internship experience and an accompanying portfolio, the emphasis is on practical, real world, professional skills.

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[5] A "Habit of Mind" is a practice or disposition for behaving intelligently when confronted by a problem or dilemma that does not have a clear, immediate answer. "Learning to use one's mind well" is one of the Coalition of Essential Schools' (CES) Common Principles for school design. All three study schools are affiliated with CES.

Mission Hill School (grades K-8)

The centerpiece of the Mission Hill K-8 School performance assessment system entails six portfolios with exhibitions. Project and inquiry-based learning in the lower grades prepare students for the middle years (grades 6-8) portfolio process. Sixth graders are assigned to help an older student on his or her portfolios, which also allows the younger students to learn more about the process. At the end of the 7th grade, students complete and defend their qualifying and "beyond the classroom," community involvement portfolios. In 8th grade, students complete portfolios in humanities, mathematics, science and technology, and the arts. The portfolios include evidence pieces selected from the student's work in grades 6-8 and a new piece specifically for the portfolio. Some subjects also include an on-demand component such as a math exam or a research task in social studies. The goals for the portfolios include academic preparation for high school and the development of self-knowledge about one's strengths and weaknesses as a learner. Portfolios are assessed on each subject's content requirements, connections to Habits of Mind (viewpoint, evidence, relevance, connections, conjecture) and Habits of Work (reliability, resourcefulness, ability to work with others and to meet deadlines), and a student's oral, written and visual presentation (including use of technology).

Sampling and the Study Population

The main source of data for this study comes from a sample of 92 in-depth interviews with graduates of the three schools. We derived additional context from interviews with school staff and founders, our own participation in performance assessment events, and examination of documents about the school and its performance assessment system.

We sought to create a sample with representation on dimensions of race and ethnicity, academic performance while at the school, time since graduating, and post-high school pathway. We employed several strategies to develop a representative sample. As we conducted interviews, we pursued initial contact with students likely to be connected to different networks and made efforts to recruit from underrepresented demographic categories and graduation years. While we were unable to determine whether a potential interviewee had high, average, or low grades until we had already conducted the interview, in an attempt to offset an expected skew toward the most academically successful students, we asked school founders, leaders, and staff to suggest interviewees that had struggled academically or in other ways while at the school. Though the proportions of graduates in our sample are not exactly balanced with the school populations on all dimensions, we believe we obtained a representative sample of the three school populations and that the study participants' viewpoints capture the overall experience of graduates at the three schools. During analysis, we reached a saturation point of information from the interviews, which indicates that we captured a representative sample of the student experience at the study schools (Guest, Bunce, & Johnson, 2006). Table A summarizes the characteristics of the sample; additional data is also available in Appendix C.

| Table A. Sample Dimensions and Characteristics		
School	Number of Graduates in Sample*	Average graduating class size (#)
Boston Arts Academy	41	73
Fenway High School	36	54
Mission Hill School	22	14
Gender	Number in Sample	Percentage of Sample
Female	39	42%
Male	53	58%
Race/Ethnicity	Number in Sample	Percentage of Sample
Black	38	41%
Latino	26	28%
White	20	22%
Multiracial	7	8%
Asian	1	1%
Age/Life Stage	Number in Sample	Post-secondary education path (%)
Still in High School	11	N.A.
Up to Five Years since HS	46	82% currently enrolled in college or graduated from 2-yr program (only 1)
Five Years or more since HS	43	72% completed post-secondary degree
Of the 92 participants, seven people who attended and were interviewed about more than one school (Mission Hill and either BAA or Fenway) are included in the relevant counts disaggregated by school.		

Caveats for Understanding this Study

Though participants often make comparisons between different schools they attended or their perceptions of what other schools are like, it is important to note that this is not a comparative study. School choice policy in Boston allows students to self-select schools in ways that could be correlated with other individual indicators for school success. The demographics of the schools mirror those of the Boston Public Schools populations, but we are not comparing the success rates or outcomes to other schools (BPS or otherwise). Rather, our cross-sectional design records a selection of graduates' memories and perceptions of their past educational experiences at one point in time. Though memories might be imprecise due to memory loss or circumstances at the time of the interview, these memories and perceptions offer powerful insights into how people learn and how they define success for themselves. Lastly, while other schools may also use performance assessments, the distinction we draw is about what happens when a school practices performance assessment on a whole school level in a comprehensive system.

Introduction to Findings

To understand the context in which students experience performance assessment, we begin where most interviewees began their stories: with overall impressions of the school culture. Key school characteristics include a small and nurturing environment, a strong sense of community, personalized relationships, and safety. While the rich process by which schools foster community and set the context for learning is not fully explored in this paper, we want to note the importance of the overall school environment, as illustrated in Diagram 1. Performance assessment cannot be taken out of context. The effects graduates in the study speak about cannot be attributed solely to performance assessment, but rather their experiences with performance assessment are nested within each school's culture and the overall learning environment they cultivate.

Diagram 1: Structure of Findings
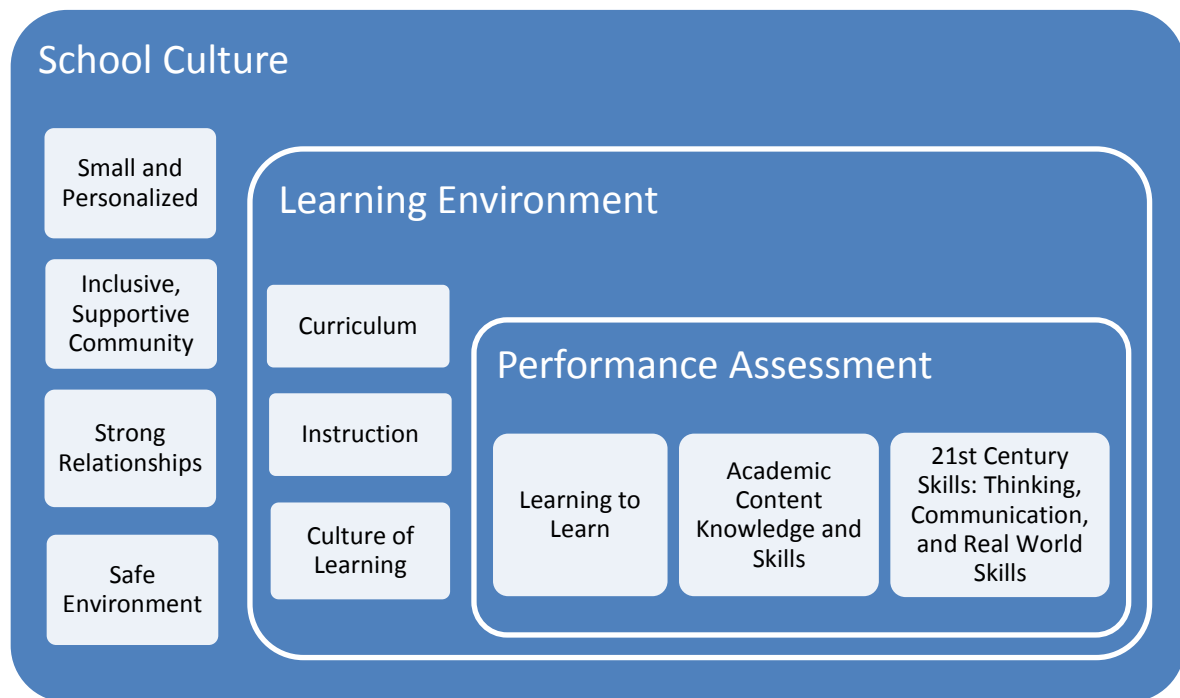
The findings related to the perceived influence of performance assessment on students' future academic, professional, and personal experiences fall into three categories as illustrated in each box of the performance assessment core of the diagram.

> *Learning to learn* captures the way the performance assessment systems intentionally nurture different learning styles and deliberately encourage students to take responsibility for their own learning.

Academic content knowledge and skills examines how performance assessment incorporates the core content and skills typically part of the K-12 curriculum (i.e. math, science, reading, writing, literature, and history).

21st century skills illustrates how performance assessment can capture other types of higher-order and complex skills such as critical thinking, communication, presentation, collaboration and real world skills.

Within each category, we examine the development of these learnings while attending the study school with attention to the role of performance assessment, how graduates use what they learned after leaving the study school, and what challenges they experience. We consider individual and school definitions of success as well as external indicators such as success in college.

The final section discusses the findings, identifies questions for future research and for policy-makers, and shares policy implications raised by student memories, perceptions, and perspectives. While performance assessment, like any one element within the complex system of education, does not offer a single panacea, it does encourage thinking about options for providing more equitable opportunities for students of different strengths to show what they know and are able to do.

Findings about Context

As illustrated in Diagram 1, the school culture and learning environment set the context for understanding performance assessment. For graduates, learning from performance assessments was embedded in the overall school culture, and therefore the effects of performance assessment must be considered as part of the overall system. This section summarizes the contextual findings about study participants' broader educational experience at the schools, though the topic will be examined more fully in a separate paper.

> *I think overall the biggest thing is the feeling that they care about you.*
> *-Ann, Boston Arts Academy*

The School Culture

The schools' goals related to performance assessments connect to their missions and other aspects of the school. Participants cite a number of factors that create a positive learning environment. The main factors include the presence of caring and accessible adults, the small size of the schools and classes, and a strong community based on strong relationships.

When asked about their strongest memories or favorite aspects of their education, almost all study participants (91%) describe the importance of the teachers and staff in their

learning.[6] They recall the sense that the adults in the school really cared about their academic success and personal well being. Teachers and staff demonstrated their commitment by being available beyond regular school hours—both at school and after hours by phone. For many students, the support they received included academic help, but also went beyond academics. Strong relationships with teachers combined with structures that encouraged bonds between students; this family-like community could provide a high level of support for students. Nearly all graduates also emphasize the close-knit community cultivated by small classes, grouping students with each other and with the same teachers for multiple years, whether by artistic discipline at BAA or by class or house at Mission Hill or Fenway.

> It's a very family-oriented environment. You definitely feel like the teachers and the people that are there care for you and want to be there…And, many times, the teachers played roles outside of teachers for me, whether I needed support personally, academically or for whatever was going on…It wasn't like, "Oh, these are extra duties outside of my job." They were more than happy to help me in most areas, which was very valuable to me.　　　　　 –Barbara, Fenway

Deliberate construction and reinforcement of structures cultivate a shared set of norms that shape each school's culture and provide a foundation for a strong community. For example, each school developed "habits of mind" that guide students and staff in their intellectual and personal growth. Chart B summarizes these habits.

Chart B. Habits of Mind of the Three Study Schools		
Boston Arts Academy Habits of the Graduate: "RICO"	Fenway High School Habits of Mind: "PERCS"	Mission Hill School Habits of Mind
Refine Invent Connect Own	Perspective Evidence Relevance Connection Supposition	Viewpoint Evidence Relevance Connections/Cause and Effect Conjecture

Based on strong relationships and achieved by designing school structures that intentionally encourage students and staff to get to know each other well, the school community sets the context for learning. For example, at Fenway, learning is supported by the practice of

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[6] Participants spoke about the importance of the teachers in response to a number of open-ended questions. Occasionally, the interviewers asked directly about whether a participant had any mentors. Since the interviews were mainly open-ended, with the interviewer asking logical follow-up questions, interviews mostly all touched upon the same topic areas, though not necessarily in the same order. Transcripts were coded for content and not for whether answers came from open-ended or closed ended questions, though we try to make the distinction when possible.

looping, through which teachers and students remain together for up to three years. There is time to build mutual trust and respect, a foundation that supports the intellectual engagement necessary for academic success.

The Learning Environment

Assessment is intricately connected to curriculum and instruction. Here, before focusing on performance assessment, we briefly outline how study participants remember the curriculum, the instruction, and the culture of learning. In terms of curriculum, graduates recall the interdisciplinary nature of the subject matter, in-depth exploration of topics, and the autonomy the schools had over curriculum due to their status in the district as Pilot schools.[7] In addition to being caring and available, teachers provided high quality instruction and often planned interactive, hands-on classes. Graduates also indicate that heterogeneous grouping required teachers to differentiate instruction and encouraged students to learn from and help each other.

> In our class we weren't separated by abilities or learning styles. It made a big difference because there were certain things that I may not have understood and other students were very willing to help, and vice versa…It created an atmosphere of a family and everybody sort of pitching in to ensure that others were succeeding.
>
> –Daniela, Fenway

Each school designed its curricula to favor depth over breadth, to encourage inquiry and interdisciplinary connections, and to be relevant and engaging to students. Over half of the graduates use these descriptors when asked to speak about the learning environment and academics. BAA emphasizes connections between the arts and academics. Fenway and Mission Hill both have school-wide themes related to community, culture, or citizenship that cycle on a four-year rotation, linking subjects to the overarching theme or question for the year.

> I got more freedom in what I wanted to learn at Mission Hill. They would give us a broad topic like, "We're going to study the ancient Greeks." And then students got to study anything they wanted within that…So Mission Hill probably had more creativity. It allowed me to find what I was interested in.
>
> –Alice, Mission Hill School

One founder of Fenway, which began as a school within a school for students who were struggling, describes the process of "building a curriculum that matters."

> That was our orientation, ask questions, don't take anything for granted and listen to the kids…We asked kids back in 1984 what was on their mind and they said: gun

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[7] Pilot schools are unionized, district schools that have "charter school-like" autonomy over key areas: budget, curriculum and assessment, governance, professional development, school calendar and scheduling, and staffing. More information about Pilot schools is available in Appendix D.

violence, nuclear war, "Am I going to get a job?", HIV, poverty. Over the years we've done Facing History and Ourselves[8], an AIDS project, gender identity. We built a Fenway Toolkit of Essential Questions, Habits of Mind, and Safety Guidelines[9]… [There were] a lot of ways to deepen the relationship between students and between teachers and students.

With this curricular orientation, teachers take steps to ensure that students understand the material rather than just covering material and moving on to the next topic. Teachers work to provide different levels of challenge or ways to demonstrate understanding to meet the learning needs of students within heterogeneously grouped classrooms. The way members of the community relate to one another and the way teachers present subject matter naturally connects to how student learning is assessed.

Findings about the Role of Performance Assessments in Shaping Graduates' Academic, Professional, and Personal Lives

Within the context of the school culture, an infrastructure of performance assessment guides student learning. This section is organized into three categories of performance assessment learning: Learning to Learn, Academic Content Knowledge and Skills, and 21st

Century Skills. Within each category, we share how students describe what and how they learned through performance assessments while attending the study school. We also describe how they have been able to use these learnings and how their learnings affected their transitions to college and beyond. Finally, we examine the challenges related to the focus on performance assessments in participants' schooling.

School Environment

Learning Environment

Performance Assessment

Learning to Learn

Academic Content Knowledge and Skills

21st Century Skills
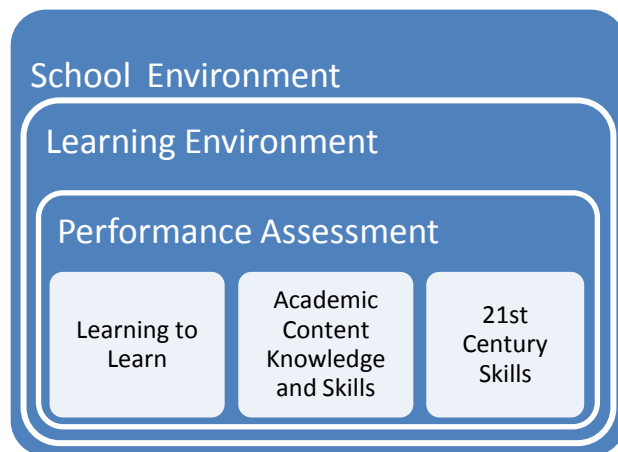
Learning to Learn

The idea that graduates learned *how* to learn emerged as a common theme. School staff members emphasize the connections between different topics and their relevance to students' lives, thereby creating multiple entry points into the content. Students who are

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[8] Facing History and Ourselves is an international educational and professional development nonprofit organization whose mission is to engage students of diverse backgrounds in an examination of racism, prejudice, and anti-Semitism in history and current issues through the lens of universal themes including identity, membership, judgment, and participation (for more information see www.facinghistory.org).
[9] Fenway Safety Guidelines: "Try it on"; "It's okay to disagree"; "No shame, blame, or attack"; "Take 100% responsibility"; "Group confidentiality"

aware of their own learning styles are better able to build upon their strengths and develop in areas of challenge. Individual choice of content or of method of performance assessment creates opportunities to engage students in both their academic learning and identity development. Through discovering their own interests and understanding their own learning styles, many graduates developed a habit of reflecting on experiences and applying those lessons in college and other settings.

Development of Learning to Learn while Attending the Study School

Graduates perceive that the schools teach something different than other schools. The difference begins with how the three schools structure students' school and learning experiences. Curriculum and instruction are designed to teach for understanding and to complete the cycle of learning, systems of performance assessments aim to actively engage students in the material to solidify their learning.

> *[Mission Hill School] doesn't just teach you how to learn but it teaches how to think and be a person."*
> *—Brigitte*

Multiple Entry Points into the Learning Process

Performance assessments provide multiple access points for students to learn and demonstrate their learning. Personalization and strong relationships further enhanced students' ability to engage in learning the curriculum.

> What I remember the most about [Fenway's] academics was how well rounded and versatile they wanted their students to be. There was no just, "Take 10 tests and whatever you score on your 10 tests, that's it." They felt everybody does well differently, and they wanted to challenge the students in different ways. So we [also] had portfolios, we had exhibitions, we had science fair projects.
> —Fred, Fenway

The schools did not leave it to students to find their own entry point into the learning process, but instead capitalized on opportunities to connect ideas and practices at all levels whether one-on-one, in the classroom or school, or in the larger community.

> [At] Mission Hill, everything that you learn could help you in another subject, or period, any other time. So, the content in the classroom was helping with the major projects. —Corey, Mission Hill and Boston Arts Academy

Building on these connections, final projects provide the time and space to learn the material taught earlier in the classroom and to make connections with outside material.

At the two high schools in the study, over one-third of students interviewed started their high school years at a different school.[10] Most of the students who began high school

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[10] Of these 25 transfers from other schools, the most common reasons for transfer related to academic struggle at their previous school. Five of the transfers were from the first graduating class of BAA where they started

elsewhere attribute improvements in their engagement in school and academic performance to their new school environments, which helped them connect to their learning. All of these students, along with those who did not begin elementary school at Mission Hill, compare and contrast their previous schools with the study schools. Though we did not study the environments of other schools, the participants' overwhelmingly emphasize the difference from their previous school describing the three schools as having a welcoming, encouraging environment where teachers "really cared" about their students' learning.

Discovering Your Own Learning Style

Discovering their learning style provided students with information that they had the opportunity to use in their education. By placing value on the different learning styles and diverse life experiences of individual students, the schools taught students how to learn and to recognize that people learn in different ways.

> I think Mission Hill taught me a lot more than just a basic curriculum. It really taught me how to learn. –Diana, Mission Hill School

Learning to learn connects to one's identity and shapes the way a person interacts with the world. The self-knowledge that several graduates describe allows them to develop their talents and to tackle challenges.

> Being good at something doesn't necessarily mean you understand the component of what it takes to actually be good, to have the talent. I could have a talent but if I don't really learn how to use that talent and figure out the fundamentals behind it, then it doesn't really become anything of value. –Evan, Mission Hill School

Performance assessments such as portfolios create opportunities for students to refine their work and develop individual strengths. Teacher- and school-created structures, such as Habits of Mind, also guide student reflection during the portfolio process.

> You see what you've done wrong, what you need to do to improve. And that's something that I don't think all high schools do. Sometimes, we rush you through the work and then you have your final test and that's it. Whereas with RICO, [you] look back at what you've done, understand the mistakes that you made and all the things that you've accomplished and show what you want to do for next year to change for the better.
> –Damian, Boston Arts Academy

Boston Arts Academy

"RICO"
Habits of the Graduate:
Refine
Invent
Connect
Own

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as sophomores when the school opened and did not have an option of beginning at BAA; however, these students' reasons for choosing BAA echoed those of students who could have started at BAA in the 9th grade but transferred later by choice.

Several Boston Arts Academy graduates describe how their learning in the arts re-engaged them in academics. One graduate remembers learning to intensively practice music and to make it unique by adding his own touches. Building on this foundation in music, he also began to engage with academic material in authentic ways. Comparing BAA to the exam school from which he transferred, he explained his belief that, though scope of curriculum content was less, a BAA education possessed a different kind of rigor more focused on the process of understanding how to learn something.

Uses of Learning to Learn after Graduating from the Study School

In reflecting on what they learned while attending the study schools, almost half (40) of the graduates speak about how performance assessments cultivated the habits of learning that prepared them to continue to learn in life. Several describe how they explicitly use strategies taught at the school, such as Habits of Mind and other structures to guide the writing process or think through a problem. Others speak about how they internalized structures for rigorous thinking. Whether they went on to higher education or the working world, graduates reported confidence in their abilities to face future challenges.

> I was prepared for life. Before I graduated Fenway, I was already living on my own. So, I was prepared mentally to deal with whatever was coming my way through, like I said, little things like the PERCS. I knew how to think. And I think that's what Fenway stressed, that you go to school to learn how to learn.   –Harris, Fenway

Fenway High School
Habits of Mind
"PERCS":   **Motto:**
Perspective   **"Work Hard,**
Evidence   **Be Yourself,**
Relevance   **Do the Right**
Connection   **Thing"**
Supposition

Graduates use the skills they learned at their schools to develop strategies to ultimately be successful in college and beyond.

> I don't think it was a disadvantage that I didn't have more of a traditional education. Where I lacked in that, I made up for in being an independent worker and being able to articulate myself and to present myself.   –Fiona, Boston Arts Academy

Self-awareness as learners allows students to be resilient and overcome challenges. In addition, fourteen of the graduates spoke explicitly about the role that their school experience played in their view of themselves life-long learners. Whether at a traditional liberal arts college or in the arts, these participants describe how they use the strategies taught at the study schools to continually improve themselves.

> My core value, I would say, as a 23-year-old right now, would be not to inspire, but [to help] others to understand that there's more. You thought you knew it all in high school, you went to college and another door of knowledge just opened to you. And it's just a hunger to know more.   –Erica, Boston Arts Academy

Academic Knowledge and Skills

Each school has a goal related to cultivating students' abilities to learn and gain awareness of how one's own learning takes place. These learning goals focus on understanding, questioning, and analytical thinking. Upon this foundation, the schools teach students content and skills with the goal of providing a well-rounded education that will prepare the students for future success. For the two high schools, the future includes the opportunity to be accepted to and succeed in college. Both schools offer college preparatory curricula. Mission Hill wants to prepare students for success in high school and beyond.

The transitions to both high school and college, not to mention the working world, inevitably require adjustments and often present challenges. Graduates from the three schools describe the ways in which they felt prepared for future academic experiences and ways in which they faced challenges.

Development of Academic Content Knowledge and Skills while Attending the Study School

When asked to describe the classes,[11] approximately two-thirds of graduates interviewed talk about how the curriculum emphasizes interdisciplinary connections between different topics, focuses on overarching questions, aims to be relevant to the world and to student lives, and values depth over breadth. The three schools generally approach content in this manner across humanities, science, and mathematics.[12] In humanities, which integrates aspects of English Language Arts and History, the result is a course that significantly shapes how students see the world. In two-thirds of interviews, graduates identify humanities as a strength or favorite course, with a number drawing particular attention to the social justice approach taken in the course. A similar approach is taken in science and math, with attention to real-world problems, inquiry and research-based projects, and an emphasis on understanding interconnections and underlying processes related to key concepts. Instead of being arranged by algebra and geometry for math or biology and chemistry in science, the course sequences are integrated.[13]

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[11] Participants were asked about academics in general, allowing them the freedom to start by speaking about any subject that stood out the most. In most interviews, the interviewer then followed-up by asking about their experiences in other subjects.

[12] Collecting detailed information about the content students learned proved difficult for a number of reasons. First, the focus of the interview was not to re-cap all of the content participants learned while at the study school. Second, participants did not always remember the details of the curricula. Finally, though we are interested in questions about the breadth of content at schools that use performance assessment compared to schools that use other types of assessment, this is not a comparative study. Moreover, study participants most often do not have a reference point for comparison.

[13] For example, both high schools use a variation of the Interactive Mathematics Program (IMP), a four-year program of problem-based mathematics that replaces the traditional Algebra I-Geometry-Algebra II/Trigonometry-Precalculus sequence with a curriculum that integrates traditional material with additional topics such as statistics, probability, curve fitting, and matrix algebra. IMP units are generally structured around a complex central problem. Ideas that are developed in one unit are usually revisited and deepened in one or more later units (for more information see www.mathimp.org).

Depth over Breadth

The deliberate choice of the depth of understanding over breadth of knowledge is a fundamental aspect of the philosophy at three schools, which are all affiliated with the Coalition of Essential Schools.[14] By definition, a "less is more" approach means teaching fewer topics in exchange for more time to explore multiple facets of a topic, why a topic is relevant, and how it connects to other topics and themes. Going into greater depth on a topic dovetails with offering multiple entry points into the learning process since it allows students multiple opportunities to "get it" by exploring a topic from different angles.

> Things we would do would sort of connect. We would be learning about [the history of] Ancient Egypt. And then in math, we would look at the Egyptian number system, and in science, we would look at the Egyptian mummifications. …Instead of breaking things off into topics where you can't understand them, it sort of builds them together so your understanding develops.
>
> –Grant, Mission Hill and Fenway

Students sometimes have choice over the content when completing performance assessment tasks. When asked what helped their learning or stood out in the academics of the study school, just over 25% (25 of 92) of interviewees stated the importance of having the chance to choose a topic of interest to explore further. The emphasis on making connections encouraged students to explore whole new areas of understanding, even when they focused their exploration on one influential person or event. For example, one graduate who chose to do his senior portfolio on Michael Jordan, described how he also learned about economics, business, and marketing. Having choice engaged him in the learning process and led to meaningful learning that he has retained years after graduation.

> A portfolio is more personal [than a test], and a portfolio is giving the pieces where you feel more passionate about the subjects. So, it entitles you to more space…to go more in-depth about what you're learning about.   –Justine, Fenway

When students have choice and passion about what they are studying, they are more likely to remember what they learn. The structure of the portfolio, especially the longer time frame, allows students to go into greater depth.

Writing and Research Skills

In order to explore content in depth, students also need to develop their basic academic skills. Many performance assessments require a written component. Students often independently conduct research and read materials related to their topics. When asked about areas in which their schools prepared them well, over two-thirds of graduates cite

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[14] One of the 10 Coalition of Essential Schools (CES) Common Principles is "less is more."

learning to write and approximately 40% say that they developed research skills.[15] Graduates offer a variety of examples of how the schools helped them develop their writing and research skills, ranging from lots of practice to one-on-one attention.

> So, yes, the 10-page paper and the 20-page paper in humanities 3 and 4 made an impact on my life. Because (1) it taught me how to write; (2) it taught me how to write in depth; (3) it taught me how to research in depth…
>
> –Henry, Boston Arts Academy

> My writing has grown considerably and I owe that all to my humanities teacher in Fenway from 9th grade to 11th grade. My writing was a disaster when I first got there and he cleaned it up a whole, whole lot. We had a lot of one-on-one meetings. I felt very comfortable talking to him and that really helped me improve my writing and my analytical skills as well.
>
> –Keith, Fenway

> But no middle school I think really challenges the students in the way that Mission Hill challenged us to write these long papers and do the research.
>
> –Giselle, Mission Hill and Fenway

Uses of Academic Content Knowledge and Skills after Graduating from the Study School

Graduates talk about being academically prepared in a number of ways. They cite a range of factors from the effectiveness of the design of school structures and curriculum to specific performance assessments that prepared them for college success. Most graduates experience a combination of areas in which they feel prepared and less prepared. Overall, in the academic categories, 74 graduates report ways that they were prepared, while 53 report areas where they feel they lacked preparation. For many, areas of strength include the social sciences and writing.

> The humanities classes, having us do the 20 page paper towards the end of

Box B. **Beyond Academics: Learning in the Arts**

Almost half of Boston Arts Academy graduates (18) in the sample pursued further education in their art or an area related to their art such as architecture or product design. Both in college and, for those who are finished their studies, in work, these graduates reported that the artistic content and skills they learned at BAA help them in their chosen artistic pursuits. Others continue to pursue their art, but not through formal study or for their livelihood.

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[15] Participants were asked: "What role did portfolios and exhibitions play in your academic and work experiences after [School]? How did these kinds of assessments prepare you for future educational experiences? Job-preparedness?" Depending on the memory and demeanor of the participant, sometimes the interview prompted with questions such as "What about writing?" or "What about in other subjects?"

the semester and then the 10 page paper before then, the debates and things like that, that got me prepared for the liberal arts courses.

–Gail, Boston Arts Academy

A number of graduates also report that structures such as the Mission Hill and Fenway Habits of Mind and the MEAL (Main Idea, Evidence, Analysis, and Link) format used at BAA help them structure their writing effectively.

> When it came down to writing research papers and any paper academically, I thought that Fenway really did prepare me to write those papers and figure out [my college writing requirements]. Because Fenway…always talked to you about your PERCS [Perspective, Evidence, Relevance, Connections, Supposition]. …And so, in my [college] papers, I always went back to that. Whose perspective is this from? What's the relevance? What's the evidence? –Lisa, Fenway

These internalized structures help both high school and middle school students in their transitions to their next level of schooling.

> I've always been good at connecting and analyzing. And viewpoint is easy for me because I consider myself considerate. Evidence is helpful in my writing, especially persuasive essays because you have to have evidence to make your opinions stronger. And…relevance, that's good for analyzing. Asking yourself if this is relevant, why does it matter. –Felicia, Mission Hill School

Mission Hill School **Habits of Mind**
Viewpoint **Evidence** **Relevance** **Connections/Cause and Effect** **Conjecture**

Approximately 25% of graduates interviewed from both Fenway and BAA also availed themselves of the opportunity to gain direct college experience through partnerships with local colleges.[16]

> I'd say take everything BAA has to offer, and use that for your advantage, like the dual enrollment, the senior grant project, all of the connections they have with all the other schools…There are a lot of opportunities.

– Natalie, Boston Arts Academy

A large majority of graduates in the sample expressed positive feelings about the quality of the performance assessment-based education at the three schools and the extent to which their education prepared them for future academic endeavors.

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[16] Most participants who spoke about cross-registration with local colleges introduced the topic, though occasionally the interviewer asked directly.

Challenges Related to Academic Content Knowledge and Skills

Despite these strengths, a number of graduates also report struggling with the transitions to high school or college. Several graduates who attend larger schools struggle in a less personalized environment. At college they often face less familiar curriculum structures and assessments, such as timed exams, and perceive an emphasis on the volume of content knowledge over understanding how topics relate to one another, especially in introductory classes.

Test Taking and Memorization

The focus on learning for understanding at the study schools means students get little practice in factual memorization. When asked an open-ended question about ways they felt less prepared, forty of the graduates interviewed cited test taking and memorization as challenge areas (mainly in college, though a number of Mission Hill graduates also say this about their high school experience).

> I'm not the best test taker. …BAA didn't really prepare you for test taking, because their whole thing was portfolios. And I think portfolios are a better measure of what you can accomplish, because not everyone can take a test, and you don't have that added pressure that makes people fail. …It was hard to go to college, because I was like, "I don't know how to study for a test." —Heidi, Boston Arts Academy

> The forum in which we showed that we learned in Fenway was based on a time period that was not confined to one 50-minute classroom, on one afternoon, where you have to pour everything into one of those little blue books, and not have the time to revise it. …So, it took about a year and a half for me to really start to feel comfortable doing that sort of test taking. —George, Fenway

Some graduates also contrast the authentic learning of performance assessment to the memorization and recall skills needed for timed exams.

> That was one thing at [my college] I would think, "Okay, I'm memorizing. That's because I'm going to be taking an exam." At Fenway, with the portfolios, I felt like I was learning. I learned it. I remember it. And I made it relevant to…why it's important. When you have these standardized exams, you're really just memorizing. —Lisa, Fenway

In speaking with participants and school staff, authentic assessment was valued over what was could be described as more standardized or traditional testing, but students at all three schools do take tests required by the city or state (the Massachusetts Comprehensive Assessment System (MCAS) tests) and each school does also have school-invented tests and on-demand assignments. For example, BAA introduced an SAT-prep component into its foundations of reading and writing course. Related to performance assessment, some Mission Hill portfolios have on-demand components.

Box C. A graduate offers advice to current seniors articulating how the value of a progressive education will compensate for challenges in interfacing with content-heavy curricula:

Know that you are ready. Know that you've learned a lot in the last four years. It may not feel right because you're going to go into a very different learning environment. You're going to go into very different learning classes. You're going to be with very different learning people. And you're going to find yourself saying, "Oh, these people know a lot of different dates. These people know a lot of different times." It's going to feel like that for the first semester or so, but pretty soon you're going to be the one with the step up…they're going to try to do what you've already done—think analytically, think beyond just dates and facts. You're going to think about why things are, the way people feel, and how things ended up….

Once you hit into the 200, 300-level courses, you're going to have the advantages…You're going to have to think about things. You're going to think about aesthetics, and looking at different ways of looking at life, and all these different things. You're going to be ready for that before other people are. So, you're going to be playing catch-up on dates and times, and you may feel discouraged about that, but you're a lot more ahead in the game than you think you are. Don't give up early because you feel behind. You're not.

    -Ian, Mission Hill School and Boston Arts Academy

Differences with Traditional Curriculum: Depth v. Breadth

A number of graduates (12/92) report struggling with historical dates, events, and people, because the curriculum at the study schools does not address these facts for as many topics. In part, graduates wish they'd had a jump start on learning these kinds of facts while in high school. At the same time, graduates value learning for understanding over memorizing information. The abilities to analyze and understand the big picture are frequently named as strengths that were helpful in future educational experiences, especially in the social sciences. The balance of these relative strengths and weaknesses, as illustrated in Box C, helps explain why humanities emerged as a strong point in the curriculum despite focusing on a narrower range of content.

Differences with Traditional Curriculum: Integrated Curricula in Mathematics and Science

The integrated math approach is designed to make higher level mathematical thinking and problem solving a core part of the curriculum. However, graduates repeatedly described difficulty in applying what they learned in their math classes while attending the study schools to traditional mathematics curricula found at many other secondary and post-secondary schools. In particular, 35 graduates (of the 79 who went to college) spoke about being unprepared for college math. The challenge mainly appears to be in the difficulty of translating understanding of integrated math to the traditional math instructional format. At the same time, integrated math engaged some students who had always struggled in math.

I definitely do [think the Integrated Math Program (IMP) was a weakness, but] I think it does help people. …When you get to college, that's not how college math is. And I'm lucky that I take really easily to math. So, I understood college math when I went back to college, but a lot of people didn't and it was hard and they had to step back and take remedial math classes.

–Maria, Fenway

A smaller number of graduates (10) also cited similar transition struggles in the sciences. While curriculum autonomy allows the science curriculum to address interesting topics not always taught at the high school level, it also leaves some students feeling less than prepared for traditional college-level science.

When I did go off to college and take chemistry courses, I wasn't very familiar with the periodic tables. We did work on it, but we didn't spend a great deal of time on it, because we were learning so many other types of science and forensics and biology. So, while I enjoyed it, because I got a little piece of everything, when I did go off to college and take different science courses, I felt like I was missing a lot of things that other people had when they came to the class.

–Nancy, Fenway

In the sample, only three graduates pursued (or are pursuing) majors in Science, Technology, Engineering, and Mathematics (STEM) fields.

21st Century Skills

Graduates connect their learning through performance assessment to skills that are useful both in and beyond academic settings. We divide these skills into three categories. First, participants describe their abilities to think with depth and to recognize different

> **Box D. Related Research on Fenway Graduate Experiences in College**
>
> A Coalition of Essential Schools study (Feldman, 2008) of the 2005 graduating classes from three CES schools, including Fenway High School, looked at college preparation based mainly on transcript analysis of students' first year and a half of college. Fenway sent almost all of their 55 graduates to 4-year institutions and the graduates performed similarly to the national sample in terms of first-to second year college retention. The study noted this as remarkable considering that Fenway is an urban school serving primarily low–income students (63% of students were on free or reduced lunch) and students of color (82.4%).
>
> In mathematics, however, a trend similar to our study was also noted. The study found that students had a higher average GPA and failed or dropped fewer courses in English than in mathematics courses. Fenway graduates earned an average grade of B- in their college English classes and an average grade of C in their college math classes. Fenway graduates also passed 37 of 40 (93%) of their first-year English classes compared with 22 of 32 of their first-year mathematics courses (69%).

perspectives. Second, students learn how to present their ideas and explain their understanding and knowledge to different audiences. Lastly, organizing multi-staged projects over an extended period of time provides a foundation for real world management skills that graduates report using in college and in their careers. Moreover, the confidence, initiative, and personal accountability cultivated by the schools' use of performance assessments help graduates adapt to new situations and overcome challenges.

Critical Thinking

The three schools have designed their curriculum, instruction, and assessment to cultivate analytical thinking skills. Supported by structures such as the Habits of Mind, the schools guide students through a thinking process. Over time and with practice, many students internalize a habit of thinking analytically and from multiple perspectives. Performance assessments occupy a central position in a systematic approach to learning.

Consistency and scaffolding in the assessment systems lay a foundation for intellectual engagement with deep thinking and thoughtful reflection about relevant topics. The schools aim to develop young adults who will engage in thoughtful discourse after their time at their study school.

> Q: *How was showing what you learned in a portfolio different than showing what you've learned on a test?*
>
> A: *It's immensely different…In a test, ABCD, circle one, or maybe write a short response. But you're going to be a lot more analytical in a portfolio, you're going to be a lot more reflective and you're going to be a lot more forward-looking. You're going to think about the future. –Keith, Fenway*

Development of Critical Thinking while Attending the Study School
Approximately two-thirds of graduates[17] describe how performance assessments require them to demonstrate, explain, or defend their knowledge.

> When you're taking a test and it's yes or no or true or false, you don't really get to display your actual learning of that subject matter. When you write, you can explain in detail what you actually have learned about that particular topic. So I think it gave us a greater depth of understanding on that subject matter and we were able to put it forward for our teachers to assess.   –Daniela, Fenway

Many performance assessment tasks require students to apply their existing knowledge about a topic to create new knowledge and understanding. These types of tasks prompt

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[17] In this section on 21st Century Skills, unless otherwise noted, most counts come from participant responses to open-ended questions about what they learned in their education and, in particular, from performance assessments, though as noted earlier, if not mentioned by the participant sometimes the interviewer did ask directly about a skill or topic such as reflection or presentation, which are examples of potential follow-up questions in the interview protocol (Appendix C).

students to do more than respond in the "correct" way; for example, to create a dialogue between historical figures, or collect data about the habits of classmates to examine correlations between risky habits and health. Performance assessment tasks require students to systematically investigate a topic through research or experimentation.

> I liked the fact that everything we learned, we had to apply. It's not stuff just straight out of the book. With the science fair…anybody who walked into the [Museum of Science] could just go right down to the first floor and ask you questions about your project. It made you learn the work, because, of course, you don't want to be embarrassed.　　　　　　　　　　　–Aaron, Fenway

Applying knowledge requires students to know what they are learning and to construct their own understandings. Both students who excelled and those who struggled academically spoke to the power of engaging deeply in their own learning.

> [The portfolio process] was interesting because it created this challenge for me. It [was] this…wonderful learning experience and people celebrated my creativity or my willingness to think outside the box.　　　　　　–Oscar, Fenway

Allowing time to learn material in class and then create a portfolio comprised mainly of performance assessment tasks helped graduates make connections between disciplines and develop as thoughtful learners.

Uses of Critical Thinking Skills after Graduating from the Study School

For some graduates, the importance of these lessons may not have been fully grasped while they were at the school, but they now identify these lessons in situations when they are starting something new, managing a staff, looking at a problem in a different light, or revising their work. These skills help graduates in seeking the best possible outcomes for a situation or project.

> A lot of times now, post-BAA, I find myself doing things habitually that I didn't do…at BAA, but BAA stressed. I don't say to myself "Oh, Henry, did you make sure that you Refine, Invent, Connect and Own on this project?" …But, I know I set these criteria for myself, now, outside of BAA. And I set them for my peers, and I set them for my staff. And, a lot of the things that I learned, I'm teaching other people who are adults.　　　　　　　　　　–Henry, Boston Arts Academy

The thinking skills graduates describe go beyond analytical thinking skills to encompass creative and artistic sensibilities, and social awareness. Communication skills and experience in real world settings further prepared graduates to make the most of their ability to think in multiple ways.

Two-thirds of graduates report they use their abilities to think critically, creatively, and from different perspectives in post-study school educational and professional experiences. This graduate, now a teacher, offers an example of how graduates use dynamic thinking.

> Fenway definitely did teach me to think outside the box and I carry that into my teaching. I think the way that I teach, the way that I speak to kids, the kind of lessons I design, the way I do final projects, was definitely shaped by Fenway.
>
> –Peter, Fenway

Other graduates also provided examples of where their ability to think critically helps in relating to other people, in tackling large projects, and generating innovative ideas.

Communication and Collaboration

The performance assessment tasks described by graduates require multiple steps and multiple modes of communication. In the most interactive forums such as exhibitions and science fairs, students explain their knowledge and understanding actively, usually in an oral presentation in which the audience has the opportunity to ask questions and engage the students in dialogue. For different tasks, the audience includes peers, older or younger students, teachers, administrators, and community members from outside the school.

Development of Communication and Collaboration Skills while Attending the Study School

Nearly 90% of graduates speak about acquiring communication skills. In particular, performance assessments frequently require a presentation component and 80% (74/92) of students interviewed say it was helpful.

> Q: What specific skills do you think you learned from going through the portfolios, both at Mission Hill and at Fenway?
>
> A: Definitely public speaking, number one; being comfortable in front of adults and being able to say, "This is what I did. This is what I learned." And being confident in your public speaking; looking at your audience and being engaging, sometimes making little jokes; but trying to keep them interested in what you learned.
>
> –Rita, Mission Hill and Fenway

Here a BAA graduate reflects on working in an interdisciplinary team on the Humanities 4 Benchmark group paper.

> It forced me to go outside of my own comfort zone. It forced me to collaborate with different people, different writing styles, different thinking styles. And it really prepared you for a lot of things that you'll do later on in life and later on in different work situations.
>
> –Janelle, Boston Arts Academy

One way the schools encourage these learnings is by having outside judges and audience members during performance assessment exhibitions or evaluations. The presence of community or family members conveys a sense that the work students present has meaning beyond their grades in the class. More than 25% of graduates (24) say that having outside audience members adds to the stakes of performance assessment tasks. The following graduate of Boston Arts Academy reflects on the experience of the Senior Grant Proposal.

> I don't think any school would entrust their students to put together something and say, "Listen, we're going to bring in outside people who are working and making the money to come in and actually choose your work and invest in us."
>
> –Karen, Boston Arts Academy

Working together in pairs or teams during class and on performance assessment tasks also helps students learn how to collaborate with others. Roughly one-third (29/92) of students say they gained team work skills at their school. Building one's understanding through the collaborative construction of ideas on long-term, in-depth projects encourages the growth of these basic interpersonal skills into empathy for others and an ability to see different people have different strengths.

> It's one of the many things that Fenway has taught you, never discourage, never turn your back on somebody, never judge somebody if he's a little bit slower or a little bit more different in any way possible.   –Sergio, Fenway

With the skills to communicate effectively, students learn to identify the strengths in others as well as identify ways to work on their own and others' weaknesses. Engaging one another's viewpoints in a constructive manner helps graduates become more aware and accepting of different experiences and perspectives.

Use of Communication and Collaboration Skills after Graduating from the Study School
Three-fourths of graduates interviewed refer directly to how they use presentation and communication skills or how the confidence generated in learning to stand in front of an audience helps them to take initiative to pursue goals. Approximately half of graduates provided examples of how having strong communication and presentation skills helped them in college and the workplace. The same graduate who first struggled with timed blue-book tests had a very different experience with other classes.

> For other classes at college where there were required presentations, or exhibitions, I excelled in those classes because at Fenway the science fair, or your Junior Review, or your senior projects, all of these required you to stand in front of an audience and talk about what you had learned, to put it into practice in front of a group of people who are assessing you.   –George, Fenway

Another graduate reflects:

> I think that the best thing you can do for a college student is to tell them how to revise an essay and to tell them how to do a PowerPoint presentation. If you can stand up in front of classmates, in front of people who maybe don't like you, in front of coworkers, your boss, or someone that wants your job, getting that confidence in high school is what Fenway taught me.
>
> –Tracy, Fenway

With personal interactions as well, over 25% of graduates spoke about the importance of being confident in seeking out help when needed. This resourcefulness might involve using the writing center, going to office hours to meet with teachers, or taking the initiative to form study groups.

> [When I got to high school], I think I was best at communicating with the adults. …I felt pretty confident in going to my teachers and expressing what I need help with and what I didn't understand. –Alice, Mission Hill School

Real World Skills

Graduates in the study report being prepared for the real world due to their school experiences. Areas they cite include preparation for life experiences, leadership skills useful at work or in their community, and professional skills such as networking. Participants say their learnings come from the process of managing extended performance-based tasks that often also connect student learning to the world beyond the classroom.

Development of Real World Skills while Attending the Study School

Three-fourths of graduates (69/92) report learning practical skills, such as organization and time management. These skills have concrete value beyond school because they transfer to college and work settings.

> Time management was something that Fenway definitely stressed to us every day; managing of time and keeping up with papers and all of that. By the time I got to college…it definitely made me more aware and conscious of when things were due. ... I was always on time, and for the most part could squeeze…into the writing center to help me get the mechanics. –Valerie, Fenway

The variety of products students produce through performance assessment tasks prepares graduates to approach new tasks with a flexible, problem-solving approach which potentially support the development of complex, cognitive skills central to 21st century skills proponents. Performance assessments also require students to reflect on the content and process of their learning and to refine their work. Across study schools, nearly three-fourths of graduates interviewed reported that many performance assessments require

students to reflect on and revise their work.[18] In addition to improving their work on the task, students learned lessons to improve their academic performance in the future.

> I definitely started to learn how to evaluate my own work, how to see my strengths and weaknesses, and see that as an okay thing to do. …I learned to talk about my work, and the rubrics, "Refine, Invent, Connect, Own," definitely gave me the building blocks for building a more organic way, breaking down, understanding about different parts of a project. —Ben, Boston Arts Academy

The two high schools place significant emphasis on preparing students for the world. Whether through Fenway's Venture Program in which students complete an internship and develop a professional portfolio they can use in the future, or BAA's Senior Grant Proposal in which students write an actual grant proposal for an executable project in the community, these performance assessments provide students with an opportunity to apply their skills in a real world situation.

Use of Real World Skills after Graduating from the Study School

Two-thirds of the graduates gave examples of how they are better prepared for the real world due to their experiences with performance assessment. Their examples range from being prepared to tackle life events such as securing one's own apartment or applying for a job to knowing how to create an effective power point presentation.

> [Performance assessments are] more like the real world [than tests]. It's more like what is actually going to happen. If I have a problem, I will find out how to do it, and then I will do it. —Lucas, Boston Arts Academy

One-third of participants attribute their ability to be flexible and adapt to new situations to their performance assessment learning. Additionally, one-third of participants also cite their ability to understand multiple perspectives and relate to different people or situations as a learning from their school experience. The following example illustrates how this ability translates into workplace success for one graduate.

> Being an assistant manager, I have to watch people and make sure that they're doing what they're supposed to be doing. So that skill has helped me assess what people's levels are, as far as commitment and education and things of that nature, when it comes to doing the actual job…I'm able to manage them by knowing what their strengths and weaknesses are. And I can do that because of the training I got from those exhibitions. —Aaron, Fenway

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[18] Most participants were asked directly in a closed-ended question.

Challenges in Teaching 21st Century Skills

While graduates offered much praise for the critical thinking, communication, collaboration, and real world skills they gained, some also raised concerns. About 10% of graduates in the sample raise a concern that sometimes they or their classmates were not actually learning what their teachers intended.

> As students, we figured out ways to cheat the system, of course. …And the reason why they could pass is because portfolio time held…a big percentage of your grade. ...So without really understanding anything that was taught…I used my other abilities, my acting skills and my charming skills, or whatever it was, to kind of get me by the first years, …[but my senior year math teacher] made it his business for me to understand what was going on. He held me accountable and made sure that I understood what was actually being taught.   –Henry, Boston Arts Academy

The challenge relates to ensuring that each student is engaged and is not simply going through the motions to get their work completed. Engagement is the key to rigor in authentic assessment, but it can be more challenging to measure when compared to measuring the learning of content knowledge using external checklists. On the other hand, a performance-based project is intended to measure something different than a short answer question or a multiple choice question.

> I learned what I needed to learn. …If they called me to explain it, I could explain it…but as far as me remembering anything specifically…once I got the A, I put it to the side. That was the last time I dealt with it.   –Marcus, Boston Arts Academy

A couple of other, mostly top students wanted to be critiqued and pushed more, even if they had already met the expected standard. A small portion of graduates, less than 10%, raised concerns that at times the reflection process in portfolios became too routine or did not add much value. Those who spoke about this topic did, however, recognize the practice as one element of what made learning different at the schools in the study.

Another recurring area of concern, also raised by about 10% of graduates, is the balance between teaching content and skills. At times, being skillful at communicating and presenting was used by participants to cover up gaps in their knowledge.

> So, I presented the half-work, and I managed to pull it off. …By just getting up there, right on the spot, and improvising, and…just working with what you have, and trying to make it sound like it's really good, when you know, in your heart, that it's crappy work. We're good at making our crappy work presentable. …I think that's what lesson you learn, dealing with the real world, and having stuff thrown at you, and you've got to improvise.   –Eva, Fenway

For the study schools, if established routines and systems result in students going through the motions to complete a performance-based task, the authenticity schools strive for can become threatened. However schools define rigor, they need to hold themselves accountable. Regularly examining assessments for whether and to what extent they incorporate rigorous content, along with integrated skills assessment, could help address this concern. The process of ensuring high expectations in performance assessment is more complex than reviewing an objectively scored test item for a lack of rigor. The on-going work of ensuring high expectations underscores that the value of performance assessment is partly embedded in a having a school culture that encourages inquiry among teachers around issues of instruction and scoring practices.

Discussion

The discussion section synthesizes the lessons that emerge from the experiences of the study participants. Learning in a school with a performance assessment system prepared students well for high school, college, and work. In all three schools, a culture that values inquiry and personal connections supports performance assessment learning. Students developed the habits of lifelong learners, practiced the ability to reflect and access resources, and, in their own eyes, managed their transitions to successful college careers. In fact, all but three participants said that, if they could go back in time knowing what they know now, they would repeat their choice to attend their school.

In addition to the overall positive experiences of study participants, the challenges faced by graduates point to areas for further investigation. The three study schools are learning organizations whose staffs engage in cycles of reflection and adaptation in order to improve their outcomes and fulfill their

> *I loved Fenway. There were so many strengths that just overpowered the very few things that could be improved….I was happy to go to school in the morning.*
> *–Nancy, Fenway*

missions. From this vantage point, some of the findings and the accompanying questions they raise present an opportunity for the study schools and other schools to critically reflect and to refine school and teacher practice around performance assessment. We also briefly consider broader educational policy and practice issues that arise from our findings: What should secondary schools be teaching? How can more students succeed in college? Can performance assessments increase access to high quality educational opportunities?

Integrating Content and Skills

Despite the integration of content and skills that performance assessments are intended to encourage, most study participants spoke of their learning as weighted more toward skills than content. In their future endeavors, graduates report drawing most heavily on the academic and 21st century skills they learned. Lasting content lessons frequently related to

social justice themes and respect for human differences. Graduates also draw upon their habits of mind and engagement with learning. They trace these lasting lessons to their schools' shared philosophy of personalizing education to guide "the whole child" in his or her learning and identity development.

Graduates report struggling in mathematics more than in other subject areas. The findings indicate a need for attention and further inquiry into mathematics curriculum, instruction, and assessment. Science was also a challenge area in college for some, although fewer participants spoke about their college science courses.

Only three students in the sample chose to major in Science, Technology, Engineering, and Mathematics (STEM) fields. At BAA, where students choose to study an artistic field intensely, it might be expected that fewer students pursue science careers. At Fenway, however, examining whether their graduates are less likely to pursue STEM fields should be a priority.[19] If this is the case, what factors explain this trend – performance assessment structures or other school factors such as the curriculum or culture? Whether or not preparation for STEM careers is part of a school's mission, it is important that schools communicate transparently about their strengths and weaknesses.

With NCLB and demands by employers for 21st century skills, the public debate has intensified as to how to balance the teaching of content and skills.[20] However, schools must teach *both* content and skills well. State standards and the standardized tests based on them often favor content and basic skills over higher-order 21st century skills. High quality performance assessments provide an opportunity to integrate the teaching of rigorous content with practice of 21st century skills. When graduates in the study spoke about shortcomings around their knowledge-base, they did not suggest teaching more content in place of 21st century skills; rather, they want both.

Developing performance assessments that elicit students' understanding of content as well as their use of skills takes experience and professional development. As a previous CCE study found (Center for Collaborative Education, 2004), assessing content knowledge requires developing rubrics that achieve a balance of skills/process and mastery of content criteria. The choices that schools make about curriculum coverage – depth versus breadth – are related to balancing the assessment of skills and content. Participants suggested that all three study schools make the choice of depth over breadth, which is congruent with the design requirements of performance assessment.

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[19] During the review of this study, a staff member at Fenway shared that the school's Lead Team recently began discussing the issue of interest or lack of interest in STEM fields (personal communication Jan 2010).
[20] The national conversation is being played out among prominent educators, business people, academics, and policy-makers. Some of the leading voices on both sides of the debate are Partnership for 21st Century Skills (www.21stcenturyskills.org/), the Pioneer Institute (http://www.pioneerinstitute.org), and Common Core (www.commoncore.org).

Remaining Questions

If students gain the skills to become lifelong learners, will they continue to learn new content on their own?

If schools succeed in teaching their students to learn to learn, as these schools do according to study participants, the students do well on metrics of 21st century skills such as communication, problem solving, global thinking, and understanding multiple perspectives. While they might not have covered the breadth of content that their peers covered in other high schools, the study participants describe how they used their skills to learn additional content knowledge (and skills) in college. In the flood of information available via the internet, what content is critical to know? What content is important to be able to find, but not necessarily "know"? Additional evidence about the cognitive processes and learning progressions of both content acquisition and skills development can provide tools to evaluate decisions about curriculum, instruction, and assessment when choosing what to emphasize in the depth over breadth approach the study schools employ.

What should students know and be able to do at benchmarks in their education, such as the end of 8th grade or high school? Who should make these determinations?

The study schools each offer a strong point of view about what they believe an education that will prepare students entails, but they still operate in the larger educational landscape of the Boston, Massachusetts, and the U.S. Despite the original language around multiple measures in state and federal accountability legislation such as the Massachusetts Educational Reform Act (MERA) and No Child Left Behind (NCLB) and the research that demonstrates the insufficiency of using a single measure to make a high-stakes decision (Forum on Educational Accountability, 2007; Stiggins, 2008), many states, including Massachusetts, where the schools are located, use an on-demand high-stakes standardized test for school and student accountability requirements. Performance assessments, used in conjunction with other kinds of assessments, may help to answer the call for multiple measures in school and student accountability.

As skepticism around on-demand tests has grown, state departments of education and the educational measurement community are engaging in a dialogue about the next generation of assessment and accountability, including how to implement performance assessment components that meet technical quality requirements (Rabinowitz, 2010). If the economic, political, and social demands of our world truly require increased attention to 21st century skills in public education, how can policy-makers provide incentives to advance the inclusion of skills development? Prioritizing the knowledge and skills that students need for success in the world today will allow educators to focus on ensuring that all students have the opportunity to learn these essentials. Understanding the consequences of policy incentives can help policy-makers deliberately use their power to value the common goal of student learning using multiple measures over a single approach to measuring it or a single pathway to reach it (Chappuis, Chappuis, & Stiggins, 2009).

Transitions between High School and College

Often, college transition issues that study participants faced related to different structures and norms of curriculum, instruction, and assessment. For example, upon entering college, study participants had little experience with memorizing large amounts of information typical of entry level college courses. The founders of the two high schools confirm this observation. Their graduates perform better at certain colleges, ones with better pedagogical alignment with their schools and with more personalized support. When graduates reflect on their experiences with colleges that use more timed tests and emphasize memorization of content, their advice to current students indicates confidence in their performance assessment-focused education. Both academically and personally, many graduates advised current students to rely on their own capacity to adapt to new environments. Graduates also appreciated the efforts each school made in preparing students for the college environment (or for high school in the case of Mission Hill). Though they recognize the challenges of limited time and resources, several participants suggested the schools expand the amount of effort spent on helping graduates to navigate new environments.

Many high schools have focused on getting their students admitted to and enrolled in college. Both BAA and Fenway have done well in this regard with 94% of BAA graduates (2001-2008) accepted into college and 91% of 2008 Fenway graduates matriculating to college (Boston Arts Academy, 2008; Fenway High School, 2008). Attention has recently shifted to college graduation rates as awareness increases about the challenges students face once they are enrolled in college. For example, one concern is academic readiness, as indicated by the number of students who need remedial college coursework (Chen & Carroll, 2005). The challenge of college persistence is illustrated sharply by the study of the college experience of Boston Public Schools class of 2000, which found that fewer than half who enrolled in college had degrees after six years, with even lower rates for certain racial and income groups (Sum et al., 2008).

Another concern is how to prepare first generation college-goers, many of whom come from urban areas and low-income families, for the shocks of college culture and being away from home (First in the Family, 2006). The three schools serve a significant proportion of low-income students[21] and at BAA, for example, approximately 80% of graduates who attend college are the first in their families (Boston Arts Academy, 2008). Many colleges have changed their policies to actively recruit first generation college-goers and low-income students (Kirst & Venezia, 2005). Therefore, they may also need to adapt their social supports and freshman year curricula accordingly. Study participants expressed an overall positive attitude about their success in navigating their transitions after graduation, but different graduates did face one or more of these challenges.

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[21] The percentage of low income students at each school during the period study participants attended ranged from 40-54% (Mission Hill), 45-58% (BAA), and 53-63% (Fenway) (MA DESE, 2010).

Remaining Questions

What are the responsibilities of both high schools and colleges for providing learning environments and supports students need to be successful in college and the work place?
The study schools and other secondary schools that use performance assessments must acknowledge that their students may struggle with the curriculum and assessment they find in post-secondary settings. The schools in the current study, for example, can examine their curricular and pedagogical choices in areas such as math and science or with timed test-taking. Colleges also have a responsibility to adapt their practice to better meet the needs of the 21st century workplace. The Council for Aid to Education's (CAE) Collegiate Learning Assessment (CLA) brings attention to the quality of teaching and learning at the college level. This assessment focuses on how colleges develop the abilities of their students to think critically, reason analytically, solve problems, and communicate clearly and cogently (Benjamin & Chun, 2003; Conley, Lombardi, Seburn, & McGaughy, 2009). A qualitative study about Coalition of Essential Schools graduates' transition to college noted that pedagogy and large class sizes in college can be a real challenge for students used to being well known and intellectually engaged as part of a learning community (Davidson, 2006). Related to the use of performance assessment, further research is needed to analyze the struggles that students face in their transition to college through the lens of the pedagogical approach taken by their secondary schools as well as consideration of other school factors.

Serving All Students

Each of the study schools has a mission of preparing all of its students for success in higher education and the work place. Their student enrollments in general reflect the diversity of Boston's school-aged children, yet in terms of graduation rates and attendance, their outcomes are higher than the district average (MA DESE, 2010; Tung & Ouimette, 2007;

> *Kids aren't going to really perform well unless they have an environment to do well. And I think we were getting that. The kind of questions we were asked, habits of mind especially, I find that I still use those in the way I think about things and the way I approach things. So reinforcing that and giving us an outlet is what I think attributed to us doing well.* —Peter, Fenway

Tung, Ouimette, & Rugen, 2006). The three schools aim to provide their students with a set of skills and knowledge that will allow them to succeed in a world where, historically, urban schools have struggled to prepare their students for college. The school environment and specific performance assessments help students explore who they are as people, as artists, as citizens and as learners.

The stories of participants, and especially those who transferred from the district's competitive exam schools, provide compelling evidence that the study schools offer a different approach to students that is more effective for many of the students who attend. Literature on multiple pathways and school choice supports the notion that one size does not fit all students (Doyle & Feldman, 2006; Meier, Cohen, &

Rogers, 2000). Many students choose schools based on their notions of interesting curriculum, reputation for academic rigor, and caring teachers (Doyle & Feldman, 2006). Ideas about equal access and opportunity, long cornerstones of American education, have evolved over time, shifting from a focus on inputs to outcomes. This shift has brought greater focus to what different groups need to attain appropriate and desired educational outcomes, and it has generated attention to multiculturalism, social justice, and the specific needs of diverse populations such as English language learners, girls, or low-income children (DePascale, 2009; Graham, 2005).

Performance assessments and the educational philosophies of the three study schools aim to account for different ways of knowing. These schools use performance assessment to offer a different curriculum and assessment approach which allowed the urban graduates we interviewed, many of whom struggled in other schools, succeed. Performance assessment may be one tool for accessing and allowing students to demonstrate knowledge and skills not typically measured by SAT scores and other standardized tests.

Remaining Questions

How can more students benefit from performance assessments?

All students can benefit from having opportunities to apply what they know and can do to relevant tasks. In some domains, such as 21st century skills and higher order thinking, performance assessment may be the best option for educating all students (National Center on Education and the Economy, 2007). Performance assessment may also more equitably allow students opportunities to build on their strengths in areas such as creative and practical intelligence which are less emphasized than analytical intelligence on most standardized tests (Stemler et al., 2009). Can schools offer choices for students based on their learning styles and interests? For some students who learn better through inquiry and hands-on interaction, performance assessment-centered schools may provide opportunities for educational success.

> *Tests aren't the end of the line…an exam one day, one hour of your life, is not going to determine what you learned in that class, or if you can apply it, for that matter. That's probably the biggest thing: hands-on learning.*
> *–Lucas, Boston Arts Academy*

In all settings, assessments should fit the learning targets. For example, a quiz might be a sufficient way to check basic understanding of core vocabulary words or an event in history. By contrast, performance assessment can be complex and time-consuming and is best suited for integrated skills assessment and application of knowledge at higher levels of cognitive complexity. This study aims to understand the process and effects of learning in a performance assessment-centered system and is not a comparative study. Further research to examine the processes and uses of learning from different approaches may also contribute to determining which outcomes are related directly to performance assessment,

which are about creating a certain school culture, and what are the various optimal combinations.

What are the necessary conditions for effectively implementing performance assessments in other settings?

An effective assessment system that uses performance assessments must address the overall school culture and learning environment. The schools in this study are small, focused on knowing students well as individuals, and teach the "why" for students – Why learn this? Why does it matter? The autonomy of Pilot school status[22] facilitated the design of these schools and the implementation of performance assessments. The sense that the study schools were different than other schools was emphasized by participants, but other schools can also provide authentic performance assessment experiences for their students. Extended and performance-based assessments are currently being discussed at the federal and states level in conversations about a comprehensive, balanced assessment system that better supports student learning (Rabinowitz, 2010; Rothman, 2010). As with any reform, success will require political commitment to providing adequate professional development to school principals and teachers, documentation of technical quality, and well-thought out plans that build schools' capacity for successful implementation (Tung & Stazesky, 2009).

Final Thoughts from Graduates

The perspectives of the study school graduates provide a rich, multifaceted look into the process of learning in a performance assessment-centered school. Their observations point to the lasting effects of the experience in their future academic, professional, and personal endeavors. While the challenges identified deserve further inquiry, these final words remind us of the possibilities of performance assessment as one tool in an educational system that best serves all students.

> I really like portfolios because I feel like the portfolio process is like every day at high school. The stress you feel right before a portfolio is like the stress you feel everyday at school. So without that I would have no idea what kind of workload [I] could [handle].   –Jada, Mission Hill

> When I was done with the portfolio, I felt good. I felt like I was holding a folder full of gems…it was a sign of my focus…these were well-written papers. It didn't just make you work hard, but it made you really feel good about what you were doing.
> –Fred, Fenway

> In my career now, I have to provide my work and show my growth [in a portfolio]. It allows you to document and format your work in a way that makes it presentable,

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[22] Pilot schools are unionized, district schools that have "charter school-like" autonomy over key areas: budget, curriculum and assessment, governance, professional development, school calendar and scheduling, and staffing. More information about Pilot schools is available in Appendix D.

that makes you proud of it, and that lets you know there's always room for growth.
                                                               –Janelle, Boston Arts Academy

The systems of performance assessment at each school played a fundamental role in how and what graduates from the study schools learned. As the findings detail, they learned in multiple ways and in a range of areas, including growing into independent learners, learning academic content and skills, and developing 21st century skills such as critical thinking, communication, collaboration, and practical intelligence. Our data show that these experiences with performance assessment systems prepared most graduates in our sample well for success in college and the workplace.

Appendix A: Methods

We draw this study's findings from in-depth interviews conducted with 92 graduates of three Boston schools, Boston Arts Academy (grades 9-12), Fenway High School (grades 9-12), and Mission Hill School (grades K-8) conducted between November 2008 and August 2009. These three schools were chosen as they have graduated multiple cohorts, possess mature performance assessment systems, and are working to develop databases of alumni for their schools.

Initial meetings with school staff to learn about each school's performance assessment system, participation as community evaluators in performance assessment events, and examination of documents about the school and performance assessments provided important information for both conducting and understanding the graduate interviews. In addition to the 92 graduate interviews, we conducted interviews with school founders and one interview with a student who attended, but did not graduate from one of the schools.

In-depth interviewing was conducted to gain a deeper understanding of the experience of students who attended schools that focus on performance assessments and the meaning they make of the experience (Seidman, 1998). Retrospective interviewing allows for consideration of myriad aspects of educational experience simultaneously and brings attention to the perceived impacts of education over the medium and long term (Eaton, 2001).

The Sample

In finding graduates to interview, we created a non-probabilistic, purposeful sample using the snowball sampling method, a widely accepted technique for identifying "hidden" populations of people through social networks (Atkinson & Flint, 2001; Watters & Biernacki, 1989). We initially relied on contacts for graduates provided by each school. At the end of each interview with the first contacts, we asked for referrals to other graduates resulting in a "chain referral" system.

We worked with each school to determine the best way to approach students for interviews. Two schools provided a master list of graduates early on. However, because schools rarely keep current information on graduates, much of the contact information we were provided was outdated. The third school also provided a master list about half way through the data collection process. When possible, we wanted a student or staff member from each school to make initial contact, as graduates were more likely to participate through a personal contact than through a cold call from a researcher. We offered students a small token ($15 gift card) of appreciation for their participation. Participants signed an informed consent letter and we use pseudonyms to protect their privacy and identity.

At each school, the first entry points differed. In addition, through the course of the data collection we used multiple approaches. At Fenway High School, the first chain referrals

began from introductions to two graduates who had participated in a 25th anniversary project with the school. Fenway also maintains an alumni website with over 200 people registered (including graduates, current and former staff, and others associated with the school), and the Associate Head of School wrote an initial letter soliciting participation. This resulted in about 10 interviews (a few more responded but were not interviewed until other contacts were made) and a number of referrals, of which we interviewed at least 5 more and so forth. At the Mission Hill School, a long-time staff member made the first introductions to students who had stopped by recently. Additionally, early on, we were able to collaborate with a former teacher who was also using in-depth interviewing to collect dissertation data around similar themes. At Boston Arts Academy, a holiday alumni event attended by over 40 graduates provided the initial list of graduates. Several graduates also currently work at the school. Later, to ensure that we interviewed graduates who are not still closely associated with BAA or who are not inclined to attend school-sponsored alumni functions, we generated contact information from a new list by soliciting suggestions the department heads of each artistic major.

Alumni databases and the social networking site, Facebook, where all three schools have alumni pages, allowed contact with a large pool of graduates. Though we were able to make initial contact with far more graduates than we used in the analysis, establishing firm contact that led to a completed interview proved more difficult. Personal referrals from a graduate who completed an interview were one of the most successful entry points.

The main criticism of the snowball sampling method is that using contacts to uncover interviewees relies on the subjects being members of a social network. We employed several strategies to develop a representative sample of graduates, based on Eaton's (2001) successful study of METCO alumni. First, we over-sampled, contacting far more graduates than we used in the analysis. Second, we continued to develop the sample as we identified new contacts. Lastly, we also sought balance in terms of academic performance while attending the study school. We attempted to reach every graduate, whether or not they attended college.

As we conducted interviews, we pursued initial contact with students likely to be connected to different networks to increase the ease of constructing a representative sample. We also monitored the sample for variety and representativeness. We made efforts to recruit from underrepresented demographic categories and graduation years. Some criteria were easier to balance than others. For example, two schools included race/ethnicity in their master graduate list, while one school did not keep this information.

Most significantly, academic performance indicators, such as school GPA, were not included in any of the school databases. The information, kept almost entirely in individual (paper or electronic) files, was not easily accessible. As a result, we were unable to determine whether a potential interviewee had high, average, or low grades until we had

already conducted the interview. In an attempt to offset a skew toward the most academically successful students, we asked school founders, leaders, and staff to suggest interviewees that had struggled academically or in other ways while at the school.

We also retrospectively assessed the extent of skew toward top students academically by modifying a method used by Bensman (2000). We asked one or two long time staff member who knew the graduates well when they were students to categorize a list of graduates. The lists included those we interviewed, those we tried to contact but did not interview, and a random selection of other graduates from the master list into top, middle (25-75%), and lower quartiles.[23] When data were available, we compared school performance and engagement data between the sample and all graduates of the school.

Data Collection

We developed a semi-structured, open-ended interview protocol based on several sources. First, an earlier pilot study interview protocol used by CCE to interview Pilot school graduates about their high school experiences, their preparation for college, their transition challenges and successes provided a starting point. Since this earlier protocol was designed to study the Pilot school experience in general, we added greater emphasis and more specific questions related to the performance assessments students experienced, the impact of performance assessments on future educational and work experiences, and how students evaluate their experiences. In the small, preliminary study mentioned above, CCE researchers found that more than half of the students cited portfolio reviews as instrumental in their transition to college, a finding that validated the focus on performance assessment.

Literature on performance assessment informed the development of the questions related to assessment. In addition, meetings with school staff and examination of related school documents allowed for questions to be tailored to the performance assessment systems of each of the three schools. We also examined interview protocols from two other studies that examined graduate outcomes years after graduation (Chamberlin et al., 1942; Eaton, 2001).

The interview protocol, available in Appendix B, includes both open and closed-ended questions about educational background, family background and education, employment, community involvement, future aspirations, philosophy of life and learning, and reflection on their overall school experience. There is a concerted focus on how each school assessed learning and the ways in which each school prepared or did not prepare the graduate for success in his or her future educational and professional endeavors.

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[23] At the smallest school which does not rank students and focuses on individual learning, all students were categorized into one of three categories: successful at the school and likely would have been successful (though not necessarily in the same ways) elsewhere, likely would be considered "at risk" and would likely have struggled in a "traditional" setting, and students who struggled at the school and likely did not get out of it what the school hoped (this third category had very few students in it).

We conducted interviews in person. In all but two cases the interviews were recorded and professionally transcribed. Once, the researcher forgot the recording equipment. During another interview, the recorder malfunctioned.

Interviewees sometimes introduced the topic of performance assessments and other times the interviewer introduced the topic through questions about learning and assessment of learning. Interviewers asked follow-up questions to clarify meaning or probe deeper into key themes. As interviewing progressed we increased our focus on exploring complex areas such as connecting the specific benefits of performance assessment learning and experiences post-graduation, especially in college. We used the criteria of sufficiency and saturation of information in determining when to end data collection (Seidman, 1998).

Analysis

Initial analysis began shortly after the first interviews and increased throughout the collection phase. Beginning analysis while conducting additional interviews allowed us to validate and explore concepts in greater depth with later interviewees (Corbin & Strauss, 2008). It also allowed us to determine that we had uncovered the main concepts related to performance assessment and the overall school experience. We created a matrix of the interviews with space for general impressions of the interview, highlights related to the graduate's experience with performance assessments, and a grid of themes to identify patterns to use in code development. Additionally, we recorded demographic data and information about what participants did after attending the schools.

We began coding transcripts in the second half of the data collection. Consistent with a grounded theory approach, we developed codes based on our initial analysis of the data and grounded in the literature about the characteristics of school cultures in which students learn and in the types of learning outcomes expected from high-quality, authentic performance assessments. Codes were organized by broad categories such as school culture, school design, curriculum, instruction, performance assessment, and post-school preparation and challenges. Using the HyperResearch program, the lead researcher and graduate intern coded the same transcripts at first and then compared codes to check for consistency. As coding continued, we held regular sessions to talk through questions and refine the code list. We also wrote a code book where we defined the codes, articulated rules for code use, and tracked code development, which aided in determining a saturation point (Guest et al., 2006).

In-depth interpretation and writing mainly occurred once we finished interviewing and coding (Bogdan & Biklen, 2003; Seidman, 1998). A number of reviewers, with a range of familiarity to the data collected and the study schools, read drafts to give feedback. This process contributed to the validity of the findings and conclusions by helping to clearly articulate the parameters of the study and refine the argument.

Appendix B: Interview Protocol

Note: This generic protocol was tailored to the specifics of each school when used by the researchers. It is presented as a single protocol here, rather than as three individualized ones. Bolded questions were anchor questions that served as open-ended starting points in nearly all interviews.

Experience at [School]

- **Tell me about why you choose to attend [School]?**
    - How many years did you attend? What other schools did you consider attending?
    - [If transferred] What was school like for you before you attended [School]?
- **What was school like as a student at [School]?**
    - What was your favorite aspect of your education at [School]? Least favorite?
    - What kind of student were you? How were your grades?
    - What were your future plans when you started? Did you expect to go to college?
    - Did you have close adult mentors during your years at [School]? If so, who were they and how did they provide guidance or support? Do you still keep in touch?
- Were the decisions you made or the choices you had (hs/college, community/extracurricular activities/sports/student govt etc) influenced by attending [School]? If so, in what ways?

Performance Assessments

- Tell me about how you were assessed at [School]? What performance assessments, such as portfolios or exhibitions were you asked to conduct in your time at [School]?
- **Tell me about your experience with portfolios and exhibitions. What did you learn? What did you think about these assessments?** [follow-up about specific elements of different PAs, presenting (which PAs had performance/exhibition elements), revising, content, lasting learning, balance between in depth learning & connections to the big picture (i.e. the historical landscape; the field of science]
    - BAA:
        - the RICO Review
        - HUM 3
        - Senior Grant Benchmarks
    - Fenway
        - Portfolios & Exhibitions (in each subject ie. Science Fair)
        - Junior Year Review
        - Senior Institute (Sr. Portfolios, Sr. Internship, Position Paper)
        - Ventures Program
    - Mission Hill
        - Graduation Portfolios
- **What role did portfolios and exhibitions play in your academic and work experiences after [School]? How did these kinds of assessments prepare you for future educational experiences? Job-preparedness? [look for specifics]**
- Did the performance assessment [interviewers usually referred to the specific PAs above; the topics below were sometimes introduced by the participant]. help you learn:
    - how to ask probing questions?
    - important information/knowledge?
    - to reflect on your work? If yes, **how and where has the skill been useful to you**?

- o to present to your peers? If yes, **how**?
- o to critique yourself and others? If yes, **how**?
- (if applicable) Were you prepared for taking traditional exams in hs/college?
- Do you still use the Habits of the Mind? [Also: The Fenway Safety Guidelines? BAA's Habits of the Graduate/RICO] If so, when and how?

Impact of Attending the School

- [Mission Hill] Which high school did/do you attend? What were you looking for in a high school? Were you prepared/not prepared for high school? How?/Why not? (i.e., socially, academically, emotionally, self-reflection, opportunities for leadership)
- [Mission Hill] [If still in HS] What are your plans for after high school?
- [Mission Hill] If graduate also attended BAA or Fenway, ask about performance assessments at BAA/FHS
- [Post-HS] How did you decide what to do after high school?
- Did your experience at [School] help prepare you for life after high school? How?/Why not?

If Higher Education:

- What were you looking for in a college? (academic programs, smallness, diversity, location, etc)
- **Were you prepared for college? Academically? Socially? Emotionally? In what ways were you not prepared?**
- What is your major?
- How did [School] prepare you for getting into college? How did your family/friends help you get into college? Where else did you turn for help in getting into college?
- If you receive financial aid, how did you obtain it? What percentage does it cover?
- Were you prepared for living away from your family?
- Were you **prepared** for navigating your college environment (predominantly white/black/middle class?) In what ways were you **not prepared**?
- Have you transferred or taken time off?
- Are you involved in extracurricular activities in college? If so, what types? Why?
- Have you graduated?/Are you on track to graduate on time?

If Working:

- How did you decide what kind of job to look for/accept?
- Were you prepared for work? Job skills? Socially? Emotionally?
- How did [School] prepare you for the working world? How did your family/friends help you find a job? Where else did you turn for help in finding your job?
- In what ways were you not prepared?

Besides education/working, are there any other significant aspects of your life that were influenced by your experiences at [School]?

Other aspects of [School] (Note: We asked schools if there were other topics they would like to know about)

- BAA
  - Are you still involved in the arts? If so, in what ways?
- Mission Hill
  - What do you remember about the Farm School? Did Farm School have an influence on your development? If so, in what ways?
  - How did you feel about the role of music and art in the Mission Hill School curriculum? Did activities in the arts (whole school singing, playing instrument, visual arts projects) have an influence on your development? If so, in what ways?
  - Mission Hill had a curriculum that was, in part, dedicated to looking at "social justice." What does social justice mean to you?
  - Mission Hill School was and is highly racially and economically integrated. How do you think that contributed to your education and experience at Mission Hill? Do you find similar integration where you attended high school?
  - Mission Hill School is considered to be a part of the "progressive tradition" in education. What does that mean to you?

Future Plans

- What are some of your core values in life? What is important to you in your life?
- What are your plans for the future?
- What advice would you give to students starting [School] now?
- What advice would you give [School] students about to graduate?
- Is there anything that you would change about [School] or wish [School] had done better? What advice would you give [School] teachers and staff? (to improve the school for current and future students and to better prepare them for life after [School])
- If you could go back in time, would you repeat your choice to attend [School]?
- Have you had contact with other alum or staff of [School] since graduation? How? (email, phone, visits) [ask for contacts/introductions]

Appendix C: School Characteristics and Sample Demographics

We believe we obtained a sample with representation on dimensions of race and ethnicity, academic performance, time since leaving the study school, and post-High School plans. The sample also includes variation in terms of parents' education levels and free/reduced priced lunch qualification[24] while in school. Though the proportions of graduates in different categories are not balanced with the school populations on all dimensions, we are confident that the findings capture the overall experience of graduates at the schools.

Table 1. Sample by School				
School	Year of First Graduating Class	Average Graduating Class Size	Number of Graduates in Sample[b]	Percent of Graduates Interviewed
Boston Arts Academy (9-12)	2001	73	41	7%
Fenway High School (9-12)	1996[a]	54	36	6%
Mission Hill School (K-8)	2001	14	22	20%

[a] *Prior to the first graduating class as an independent Pilot school, Fenway was a program within another school.*
[b] *Seven people who attended and were interviewed about more than one school (Mission Hill and either BAA or Fenway) are included in all of the relevant counts disaggregated by school.*

Table 2. Sample by Gender and Race/Ethnicity (with school and district comparison)					
Gender	Percentage in Sample	Percentage at School[a]			Percentage in BPS[a]
		BAA	Fenway	MHS	
Female	42%	62%	56%	51%	49%
Male	58%	38%	44%	49%	51%
Race/Ethnicity					
Black	41%	43%	46%	54%	43%
Latino	28%	29%	32%	16%	33%
White	22%	21%	17%	22%	14%
Multiracial	8%	4%	3%	3%	1%
Asian	1%	4%	1%	5%	9%

[a]*School and BPS Data from 2005-2006 (MA DESE, 2010).*

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[24] Statistics for Free and Reduced Priced Lunch qualification are not included because many participants were not exactly sure of their status when they attended their school.

Table 3. School Characteristics (with District Comparison[a])					
	Study Schools[b]			BPS[b]	
	BAA	Fenway	MHS		
4-yr Graduation Rate	84%	83%	n.a.	59%	
Attendance	94%	94%	96%	92%	
MCAS CPI[c]	10th	10th	8th	8th	10th
ELA	89	84	n.a.[d]	75	77
Math	78	79	60	52	78

[a]Though this is not a comparative study, this information is included to give a sense of how the study schools compare to the Boston Public Schools (including Regular, Exam, and Pilot schools) overall on these standard indicators of engagement and assessment.
[b]School and BPS Data from 2005-2006 (MA DESE, 2010).
[c]CPI is the Composite Performance Index is a 100-point index that measures the extent to which students are progressing toward proficiency in English language arts (ELA) and mathematics, respectively.
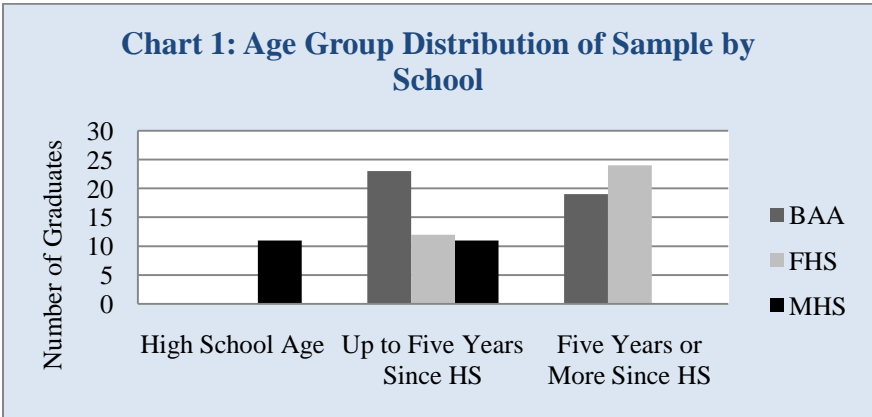[d]Fewer than 10 8th graders took the ELA exam. In 2006-07 the CPI was 75.

Chart 1: Age Group Distribution of Sample by School

Chart 2. Post-High School Pathways by Graduation Year
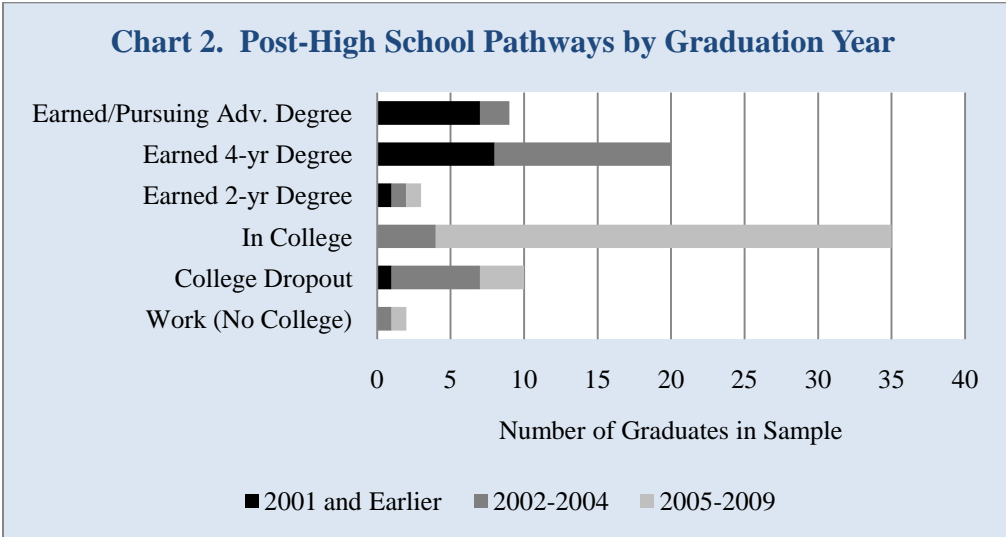
Chart 3. College Attendance by Type of College
(By the number of participants attending each type)

Type	Count
4-yr Independent	50
4-yr State Supported	24
4-yr Independent Conservatory	1
4-yr Proprietary	1
2-yr State Supported	14
4-yr Independent (for 2 yr degree)	2
2-yr Proprietary	1
Vocational	1
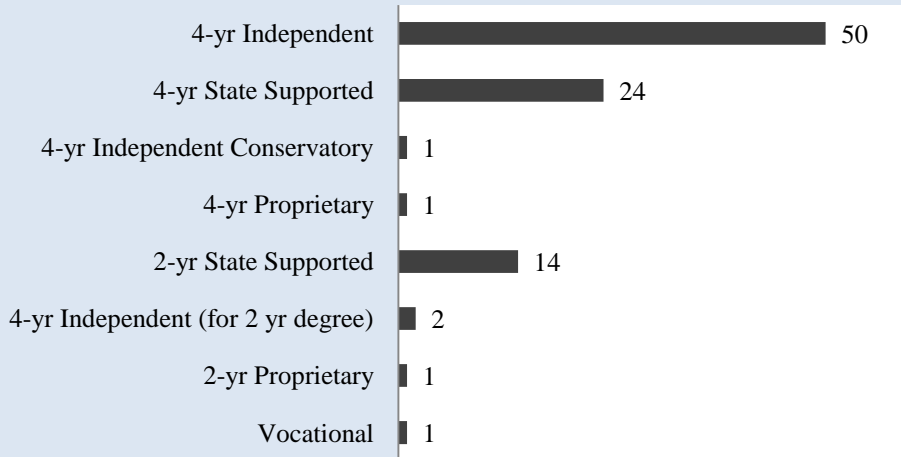
Chart 4. College Attendance by Entrance Difficulty
(Determined by Percent Accepted;
By number of participants attending each type)

Difficulty	Count
Most Difficult	4
Very Difficult	23
Moderately Difficult	45
Minimally Difficult	7
Non competitive	15
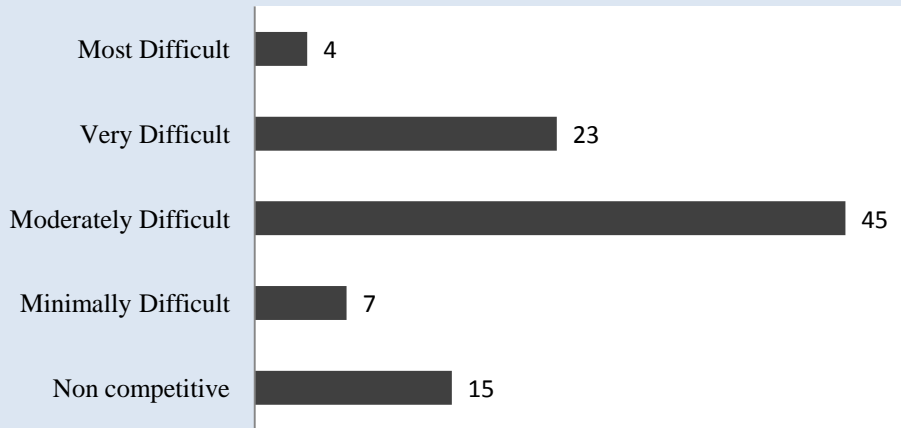
Notes:
Charts 2-4 include the 81 graduates who have graduated from high school.
Information for Charts 3 and 4 comes from Peterson's College Guides (Peterson's, 2009).
Charts 3 and 4 include all post-secondary schools attended by graduates in the sample.

Chart 5. Education Level of Parents
(By Number of Parents)
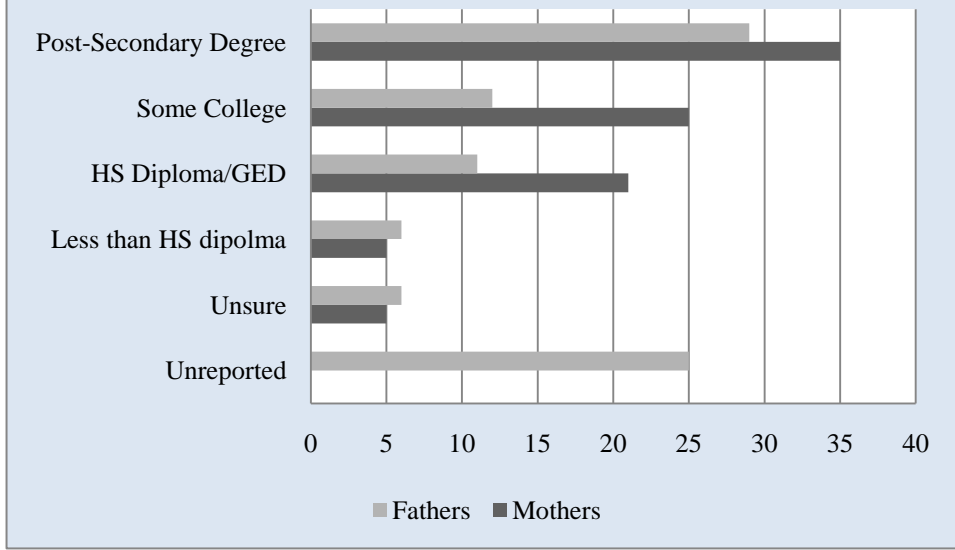
Note: Interviewees were asked, "Who was in your household while you were at [school name] and what was the farthest your parents went in school?"

Appendix D: About the Study Schools and the Center for Collaborative Education

The three schools in this study are all Boston Pilot schools. Parties from the Boston school district, school committee and teachers' union created the Boston Pilot Schools in 1994 when they agreed to give up historical control in exchange for heightened accountability. The model generates greater choice options within the Boston Public Schools (BPS) by granting Pilot schools autonomy over crucial aspects of their school design and operation. Like charter schools, but within the district, Pilot schools have autonomy over budget, staffing, governance, curriculum and instruction, and schedule. Internal and external research has shown that many Pilot schools, especially at the high school level, perform better than non-exam BPS district schools on standard measures of engagement and performance such as MCAS scores, attendance, and 4-yr graduation rates (Abdulkadiroglu et al., 2009; Tung & Ouimette, 2007). Most of the 23 Boston Pilot schools operating as of the 2009-2010 school year are small, personalized, and mission-driven; many also use their curriculum autonomy to create school assessment systems that value authentic and performance-based assessments.

All three schools are also members of the Coalition of Essential Schools (CES). Like many Coalition schools, the three sites in this study, focus on re-imagining school structures to create personalized and equitable schools with authentic assessment systems that engage all young people in intellectually challenging tasks in order that they might learn to use their minds well.

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The mission of the Center for Collaborative Education (CCE) is to transform schools to ensure that all students succeed. We believe that schools should prepare every student to achieve academically and make a positive contribution to a democratic society. CCE partners with public schools and districts to create and sustain effective and equitable schools.

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