EAB

RESEARCH BRIEF

Elementary School Library Initiatives

Structure, Implementation, and Assessment

District Leadership Forum

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1) Executive Overview

Terminology

Makerspace: This report defines a makerspace as a designated space for hands-on activities that support academic learning and promote experimentation, collaboration, and a design mindset.[1]

Key Observations

Contacts leverage library resources to teach 21st century skills (e.g., critical thinking, technology literacy, information literacy), often in support of district initiatives. At **Institution A, Institution B**, and **Institution C**, contacts employ hands-on learning strategies through makerspaces to support district initiatives (e.g., critical thinking, student engagement in STEM). At **District D** and **Institution E,** district leaders and librarians developed library initiatives that teach information literacy and research skills as part of a larger shift in district priorities toward 21st century skills.

To support classroom learning and garner stakeholder buy-in, connect library instruction to curricular standards. Librarians and teachers at districts with and without makerspaces base library instruction on curricular standards. To acquire buy-in from district leaders when initiating the library programming, contacts communicated the curricular connections. At **Institution B** and **Institution A,** librarians demonstrated the connections to administrators through in-person mock lessons or observation periods. At **Institution E,** the librarian acquired teacher buy-in by piloting the unit with one class to demonstrate that library programming can support classroom learning.

Administrators lead planning meetings on library instruction to set expectations, acquire support and resources, and alter perceptions of the role of libraries. To kick off implementation efforts, contacts at **District D** and **Institution B** communicated a new vision for the library program at meetings with district leaders. At **Institution A**, the librarian, teachers, principal, and administrators used planning meetings to discuss makerspace logistics (e.g., space, funding, scheduling). Each profiled district included a different combination of the following stakeholders in planning meetings: librarians, principal, technology specialists, teachers, and parent representatives.

Collaboration between teachers and librarians proves vital for the success of library initiatives. While the timing and format of collaboration vary among profiled districts, all contacts report that teacher-librarian collaboration is critical to library programming that supports curricular standards. At **District D**, librarians and teachers collaborate during curriculum planning sessions throughout the summer to ensure that the library units will support the classroom learning that teachers are planning for the upcoming year. At **Institution C**, the librarian meets frequently with teachers to plan makerspace lessons that effectively extend classroom learning and support 21st century skill building.

Profiled districts assess the impact of library instruction by observing student engagement and conducting student assessments. Contacts at each profiled district report an increase in student engagement as a key impact of library instruction. While some profiled districts do not conduct assessments to gauge the impact of library instruction on learning, contacts at **District D** report that librarians use quizzes to grade student work in the library. At **Institution A,** the librarian

1) Herold, Benjamin. "The 'Maker' Movement Is Coming to K-12: Can Schools Get It Right?" Education Week. June 6, 2016. Accessed October 12, 2017. http://www.edweek.org/ew/articles/2016/06/09/the-maker-movement-is-coming-to-k-12.html

assesses the impact of library instruction through a rubric that evaluates student learning on topics and general skill building.

2) Makerspaces

Structure

Develop Hands-On Library Programming to Encourage Student Engagement and Knowledge Retention

Research shows that hands-on learning is advantageous for students of all ages. A 1983 meta-analysis of 57 studies that measure nine aspects of student performance (e.g., process skills, creativity, language mastery) showed that students in activity-based programs perform up to 20 percent higher than students in traditional (i.e., textbook-based) programs on all measured outcomes. The analyzed studies concluded that the greatest student gains from hands-on activities were in academic achievement and process skills.[2]

While the 1983 study remains the most comprehensive analysis on the impact of hands-on teaching strategies, a 2007 study also found impressive growth among students who engage in hands-on learning activities. The Harvard study concluded that hands-on, discovery-based teaching on astronomy is approximately four times more effective in terms of gains in learning for third through sixth grade students than the traditional teaching methods used in a control group.[3]

In 2008, a Purdue University study found that students who participate in hands-on science projects learn more and demonstrate a deeper understanding of relevant concepts than students in a traditional (i.e., textbook-based) group. The Purdue University research also shows that gains in learning prove especially significant for English-language learners, who benefit from instruction that does not depend solely on written and spoken language.[4] These findings suggest that teachers can leverage hands-on learning methods to increase gains in learning.

Consider Creating a Makerspace to Incorporate Hands-On Learning into Library Instruction

Because school districts typically regulate library instruction less than classroom curricula, libraries are an effective place to implement innovative pedagogy (e.g., hands-on learning). Additionally, because libraries are often larger than classrooms, they can better accommodate hands-on instruction. To facilitate this instruction, elementary, middle, high school, and public libraries use makerspaces. Makerspaces are designated spaces for hands-on activities that support academic learning and promote experimentation, collaboration, and a design mindset.

Administrators at profiled schools with makerspaces designate a library classroom or area within the library as a makerspace. Within this space, librarians group tables and chairs into stations to facilitate student collaboration. Librarians place materials on each table for students to use during guided lessons or free-play tinkering sessions. While some makerspaces include high-tech equipment (e.g., 3D printers, coding bots), many makerspaces utilize low-tech materials (e.g., K'nex, cardboard).

2) Stohr-Hunt, Patricia M. "An Analysis of Frequency of Hands-On Experience and Science Achievement." *Journal of Research in Science Teaching* (1996): Vol. 33: 1. https://vista.gmu.edu/assets/docs/vista/JournalOfResearch.pdf
3) Ward R. Bruce, Sadler, Phillip, and Shapiro, Irwin. "Learning Physical Science through Astronomy Activities: A Comparison Between Constructivist and Traditional Approaches in Grades 3-6." *Astronomy Education Review* (2008): Vol. 6:2. http://adsabs.harvard.edu/abs/2007AEdRv...6b...1W
4) "Study: Hands-on projects may be best way to teach engineering and technology concepts." Purdue University. January 28, 2009. Accessed October 12, 2017. https://news.uns.purdue.edu/x/2009a/090128DarkStudy.html

Connect Lessons to Curricular Standards to Ensure Makerspaces Support Classroom Learning

District leaders at three profiled districts leverage makerspaces to both introduce new concepts and to support existing classroom learning. While librarians tie makerspace lessons to standards across all subjects, contacts at **Institution C** report makerspaces prove particularly effective in science instruction. Contacts at **Institution B** note that makerspace lessons teach students skills that are outlined in district or state standards, but that prove difficult to instill in a traditional classroom setting. At **Institution A**, makerspace lessons often address the most difficult standards from a hands-on perspective, which allows students to revisit challenging topics previously introduced in the classroom.

Use Makerspace Instructions to Connect Activities to Standards

At **Institution C**, the librarian ties standards to makerspace lessons by posting an outline of the makerspace activity and its correlated curricular standard at each makerspace station. These "makerspace instructions" serve as a constant reminder of the educational value of makerspace learning.

Example Standards-Based Lessons

Example Standard *The student is expected to…*	*Example Lesson* *The student will…*
…Identify factors that influence the motion of an object and determine the relationship between speed and distance traveled over time.	…Assemble a structure from cardboard and other materials that a marble can run down. …Measure marble speed.
…Demonstrate that electricity travels in a closed path, creating an electrical circuit.	….Manipulate snap circuits to create a closed path for an electric current.
…Describe the food groups, including recommended portions to eat from each food group. …Solve word problems involving division of whole numbers leading to answers in the form of fractions by using visual fraction models.	…Use plastic knives to cut fruits and vegetables into recommended portions that are represented in fractions.

Makerspaces Function within Diverse Scheduling Systems

Institution A, Institution B, and **Institution C** each use a different scheduling system for the makerspace and library, suggesting that an administrator may implement makerspaces within a variety of preexisting library schedules.

Library Scheduling Systems at Profiled Districts

Flexible Scheduling

At **Institution C**, classes do not visit the library according to a set schedule. Teachers schedule instructional visits to the makerspace using a sign up sheet. When the library is open, students are welcome to visit to check out books. The advantage of this system is classes can visit the library when it is most convenient for the teacher and students.

Fixed Scheduling with a Full-Time Librarian

At **Institution B,** classes visit the library twice a week for thirty minute sessions. Students exchange books during one visit and complete instructional work during the other, typically in the makerspace. The advantage of this system is the librarian spends time with every student, regardless of the teacher's commitment to library instruction.

Fixed Scheduling with a Part-Time Librarian

At **Institution A,** classes visit the library once a week for forty minutes on a fixed schedule. During this period, the librarian leads both makerspace instruction and book exchange. The librarian only works at the elementary school every other day. The advantage of this system is teachers can use the library and makerspace when they are unoccupied.

To Ensure Continuity in Instruction, Encourage Teachers and Librarians to Collaborate on Makerspace Lessons

Contacts at **Institution C** stress that library clerks provide necessary support to librarians by freeing them from administrative tasks. Librarians spend more time collaborating with teachers, planning lessons, and implementing effective library instruction.

District or school administrators at **Institution A, Institution B**, and **Institution C** designate time for teacher-librarian meetings before, during, or after school to encourage frequent and ongoing communication. Contacts warn that administrators should be aware of how teacher and librarian planning periods overlap.

At all three profiled districts with makerspaces, librarians ground these lesson-planning conversations in curricular standards. At Institution C, contacts recommend that administrators grant librarians access to the district's curricular standards so librarians can familiarize themselves with classroom learning. This promotes library programming that supports classroom curricula. At Institution A, because the librarian previously worked as a teacher, teachers and librarians share a common understanding of the district standards and maintain strong relationships.

Librarians at Institution A and Institution C meet one-on-one with teachers to plan makerspace lessons. During these meetings, which can span 15 minutes to an hour, the teacher and librarian identify a standard, craft a lesson to address the standard, determine necessary materials, and designate a time to implement the lesson. Then, the librarian, teacher, or both dedicate additional time to prepare for the lesson. For example, after the planning meeting, the librarian at Institution C gathers relevant materials from the library's collection to utilize during the lesson. Before the lesson, the librarian also assembles necessary materials at makerspace stations. Additionally, the teacher introduces relevant concepts to students before the librarian conducts the related makerspace lesson.

Include Brief Lectures, Hands-On-Activities, and Open Discussions within Makerspace Lessons

The format of makerspace lessons varies by subject, teacher preference, and scheduling system. However, all contacts report that makerspace lessons often include lectures, small group collaboration, hands-on work, and discussions. The delivery method for makerspace lessons also varies. While teachers and librarians deliver makerspace instruction in a co-teaching format at **Institution C**, at **Institution B**, the librarian leads makerspace instruction. For the latter model, contacts note that teachers must inform librarians about the level of student understanding on relevant topics before makerspace instruction takes place.

Sample Makerspace Lesson Process

1. 
   The librarian reviews a concept previously introduced to the students by the classroom teacher. The librarian then provides students with a related problem and an overview of makerspace etiquette.

2. 
   The librarian facilitates hands-on activities at makerspace stations that allow students to address the given problem by creating an artifact.

3. 
   The librarian reconvenes the class to review the academic concept and discuss how their artifacts engage with the problem.

Additional Strategies to Support Student Engagement in Makerspaces

- Allow students to tinker in the makerspace during recess or after school.
- Incorporate elements of student choice into makerspace lessons (e.g., allow students to choose activity stations).
- Provide relevant supplementary materials for reading after makerspace lessons (e.g., non-fiction books, review worksheets).

Librarians or District Administrators Initiated the Creation of Makerspaces at Profiled Libraries

Visits to local makerspaces can also be an effective strategy for acquiring teacher and librarian buy-in. Contacts note that teachers became more comfortable with makerspaces after observing a lesson at a nearby school.

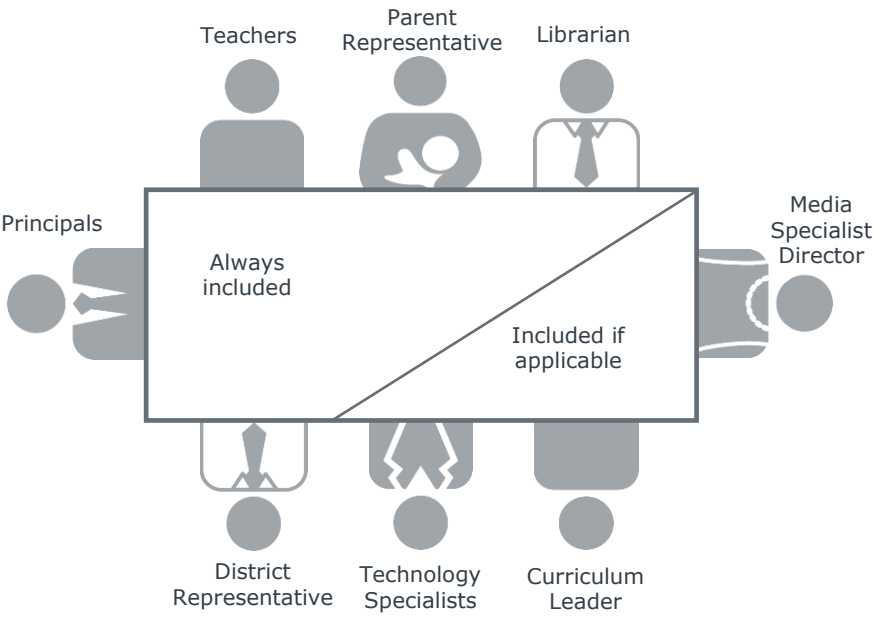
At **Institution B**, the superintendent initiated the creation of the makerspace. District administrators scheduled visits to makerspaces at local schools as the first step in the planning process. The visits and conversations with local librarians allowed leaders to understand the process of implementing a makerspace and the significant structural diversity among existing makerspaces. Similarly, at **Institution A**, district leaders realized that makerspaces could help the district meet its goal to equip students with 21st century skills and that classrooms could not offer space for the type of learning a makerspace could promote. At **Institution C**, the librarian initiated the creation of the makerspace by bringing the idea to the school principal. The principal granted the librarian a shared space to test makerspace instruction. The space, a room near the library, previously served as a space for conferences and test-taking. For the first year of the makerspace, the librarian and school community shared the room for a variety of uses. In the second year, the principal granted the librarian exclusive access to the space.

To Ensure Stakeholder Buy-In, Meet with School and District Administrators Early and Often

Prior to implementation, contacts at **Institution A** and **Institution B** gathered stakeholders for makerspace planning sessions. Both districts credit early and continuing conversations with stakeholders for the overwhelming buy-in for and ease of implementation of their respective library makerspaces.

At stakeholder meetings, contacts at Institution B introduced the idea of a library makerspace, discussed the motivations for the space, and presented supporting research. Once leaders introduced the initiative, stakeholders used meetings to consider what funding, materials, professional development, and other resources would be necessary to implement the makerspace. Additionally, stakeholders identified the ways each stakeholder would contribute to makerspace implementation. Throughout the meeting process, stakeholders provided a continuous stream of feedback to shape the makerspace.

Stakeholder Meeting for Makerspace Planning at Profiled Districts



Highlight Connections between Makerspace Programming and District Priorities to Secure Buy-In

In addition to recurring stakeholder meetings, contacts at profiled library makerspaces communicated the connection between makerspace lessons and district goals (e.g., strategic initiatives,curricular standards) to secure buy-in. Contacts at the elementary school in **Institution A** report that administrators did not encounter difficulties in attaining stakeholder buy-in because the library makerspace aligned with the district initiative on computational thinking. At **Institution B**, the district adopted a similar mission to foster student-centered teaching strategies and develop 21st century skills within the student body. By communicating the makerspace's alignment with this mission, contacts acquired stakeholder buy-in.

To illustrate the connection between makerspace programming and district priorities, librarians at Institution B held a lesson demonstration for district administrators during an in-service day. Additionally, teachers and administrators occasionally observed live makerspace lessons with students to gather an understanding of the connection between district priorities and learning in the makerspace. During these sessions, administrators also observed the level of student engagement with curricular material.

Procure Funding and Materials from the District, Local Foundations, and Parents to Stock the Makerspace

Contacts at **Institution B** and **Institution C** acquired funding and materials for their makerspaces from a variety of sources rather than solely through district funds. At Institution C, makerspace funding originated from a small grant from the district's educational foundation. The librarian used this funding to purchase low-tech materials. At Institution B, district administrators reorganized the technology budget to allocate funds for a makerspace. Additionally, administrators solicited the Parent Teacher Association for funds, applied for local grants, and utilized federal funding for innovation in schools. Contacts note that a makerspace does not require a large budget, especially when librarians buy materials at discounted prices or community members donate used goods. In fact, contacts found that students often enjoy working with low-tech materials (e.g., cardboard, magnets) more than more expensive materials (e.g., 3D printers).

Example Sources for Makerspace Materials at Profiled Districts

All Profiled Districts Observe an Increase in Student Engagement Due to Makerspace Programming

While no profiled districts measure the impact of their library makerspace through quantitative student assessments, all districts report an increase in student engagement since makerspace implementation. At **Institution C,** teachers and librarians report a notable increase in student engagement with topics that incorporate makerspace programming relative to those that do not. The librarian at Institution C also points to students' choice to visit the makerspace during recess as evidence that students enjoy the space.

Measure Makerspace Impact through Space Utilization Metrics and Individual Lesson Assessments

To maintain stakeholder buy-in, contacts communicate the impact of makerspaces to parents, teachers, and administrators through social media, newsletters, and annual reports.

At **Institution A**, the teacher and/or librarian adapts a rubric originally made by a STEM classroom teacher to assess student learning and skill-building after makerspace lessons. The librarian adapts the rubric for each lesson and uses the rubric to evaluate student engagement with a standard, student progress in teamwork skills, and student progress in problem solving skills. At **Institution C**, the librarian does not conduct student assessments after makerspace instruction, but does track utilization of the makerspace. Tracked metrics include the number of students who visit the makerspace, students who visit each makerspace station, classes that visit the makerspace, and standards that makerspace lessons address.

3) Additional Library Initiatives

Structure

Enhance Classroom Learning and Teach 21st Century Skills through Library Instructional Periods

At **District D**, librarians lead students in small group instruction, semi-independent research, and full-class discussion on topics related to classroom work or to a 21st century skill. Recent topics include digital citizenship, social change, and author biographies. Librarians at District D conduct many of the instructional library lessons using web-based modules. Librarians create the modules independently, recycle modules created by other librarians, or find and adapt modules from publicly available sources. No matter the source of the module, the librarian correlates the lesson with a specific curricular standard. Additionally, to encourage analytical thinking, the librarian incorporates online research activities and brief assessments into each module.

At **Institution E,** the librarian leads students in project-based learning (PBL) during library instructional periods. According to the Buck Institute for Education, "PBL is a teaching method in which students gain knowledge and skills by working for an extended period of time to investigate and respond to an authentic, engaging and complex question, problem, or challenge."[5] At Institution E, the librarian leads PBL projects for kindergarten to fifth grade classes. When possible, the librarian designs projects to build on skills students learned in PBL cycles during the previous academic year. Projects may support a variety of classroom subjects including science, social studies, and language arts, with science being particularly prominent in second to fourth grade classes. The librarian leads PBL units that support science curricular units (e.g., comparison of animals) or grade-wide science fairs. Each PBL unit follows a similar process that can span weeks or months, depending on the scope of the project and presentation.

Librarian-Led Project Based Learning Process at *Institution E*

Initial Instruction

The librarian and teacher co-teach on a standards-based subject. The librarian provides students with an overview of the project process.

Questioning Lesson

The librarian guides students in a discussion to establish research questions related to the subject.

Research and Analysis

Students work individually or in groups to conduct research that answers the questions established in the previous phase. Students use online and print sources to gather and synthesize information.

Presentation

Students present their findings to each other through speeches, posters, or an artifact gallery.

5) "What is Project Based Learning (PBL)?" Buck Institute for Education. Accessed October 12, 2017. https://www.bie.org/about/what_pbl.

Maintain Flexibility in Library Curricula to Maximize Opportunities to Support Classroom Learning

Rigid library curricula may limit librarians' ability to adapt to classroom needs. At **District D** and **Institution E,** librarians maintain flexibility to accommodate last minute changes in classroom learning and space needs. For example, at District D, library curricular units support particular standards but are not written chronologically. Because of this, librarians lead lessons depending on the lesson schedule set by the classroom teacher, which may change year to year. Like District D, the librarian at **Institution E** does not plan the PBL units in a particular order and can therefore execute lessons depending on each class' or grade's needs. Additionally, if the teacher makes last minute changes to the curricular schedule, the librarian can prepare to lead a PBL unit on one week of notice. The librarian also adapts to the school's needs by hosting lessons in the library, computer lab, or classrooms, depending on space availability.

Scheduling and Staffing Models Impact the Extent of Teacher-Librarian Collaboration

To design library instruction that supports classroom learning, librarians collaborate with teachers and district administrators. **District D** and **Institution E** use distinct collaboration processes to craft and execute instructional library programming. These collaboration processes complement the staffing and scheduling models utilized at each school/district.

Teacher-Librarian Collaboration Models at Two Profiled Districts

	District D	Institution E
Staff and Scheduling Model	Classes visit the library for 50 minute periods. During these periods, librarians lead instruction, releasing teachers for planning time.	Classes do not visit the library on a fixed schedule and the librarian does not have a set time with each class. When the librarian is working with classes, a clerk assists students who visit the library for book check-out.
Collaboration Timing	Teachers and librarians meet during summer curriculum development sessions. Both parties continue collaborating throughout the year through brief meetings or email communications.	The librarian meets with teachers based on the teachers' scheduling needs. This typically leads the librarian to host meetings over the summer, before school, after school, or during teacher prep periods.
Collaboration Content	Librarians and teachers work together to write or edit library units according to state standards, district initiatives, and AASL guidelines.	The librarian and each teacher choose a topic for PBL units, determine how students will be grouped, outline the research and presentation process, and identify any necessary preparation.

Librarians or District Leaders Initiate the Integration of Library Instruction with Classroom Learning

While **District D** integrated library instruction with classroom learning using a top-down approach, **Institution E** initiated librarian-led PBL units through a bottom-up process. At District D, the media center director crafted a new vision for the role of libraries in the district's elementary schools. With support from the superintendent, this leadership rebranded the district's libraries as instructional partners for 21st century learning. The leaders then worked with librarians and teachers on professional and curriculum development that supported the district-level vision. The library curricular units resulted from this effort.

At Institution E, a single librarian initiated efforts to implement PBL units in library programming. This librarian attained support from the school principal and a few teachers to begin PBL units in collaboration with classroom learning. The initiative expanded through word-of-mouth until it became a norm within the school. Now, the initiative is expanding to other schools within the district.

District D Administrators Conduct Professional Development Sessions for Librarians to Initiate a Shift in Library Utilization

- District-level library leadership host professional development sessions during in-service days and summer break for all librarians.
- During professional development sessions, District D leaders share information about current district priorities (e.g., 1:1 technology initiative) and describe how the library program will support the initiative.
- District leaders show instructional videos and lead interactive lessons during professional development sessions to set expectations about library programming and encourage innovation.

Contacts Leveraged Strong Relationships with Stakeholders to Acquire Buy-in for Library Initiatives

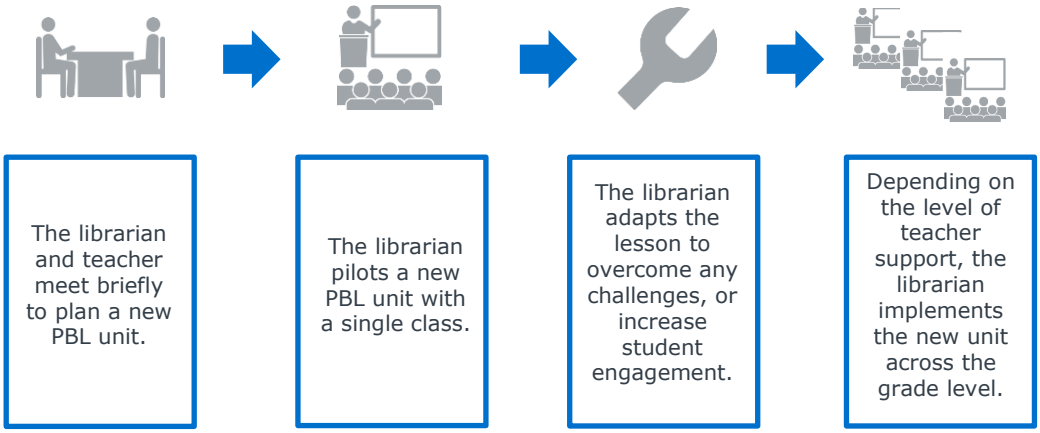
Whether initiated through a top-down or bottom-up process, contacts stress the importance of cultivating strong relationships with stakeholders to acquire support for piloting and expanding library initiatives. A district-level library leader at **District D** leveraged a strong relationship with the superintendent to communicate a new vision for the district's library program. Contacts report that the most critical step for gaining buy-in was communicating to district leaders the ways libraries contribute to the work of classroom teachers. Once leaders implemented the initiative, administrators often asked librarians to lead brief sessions for teachers on library programming and resources. Through these sessions, the district leaders capitalized on existing relationships between librarians and teachers at the school level.

The librarian who initiated PBL library units at **Institution E** relied on preexisting relationships with teachers to acquire support for PBL library instruction. Once the librarian convinced one teacher to work collaboratively on a PBL unit, other teachers became excited about implementing units in support of their own classroom curriculum. Contacts also credit the librarian's leadership role in lesson preparation and execution as one factor that encourages teachers to support the initiative. To generate district-level support for PBL units, the librarian held a demonstration of a sample PBL unit for administrators. The demonstration illustrated the ability of the units to teach 21st century skills and led to the expansion of PBL units to other elementary schools.

Consider Using a Pilot Process to Improve Lessons before Implementing Them across an Entire Grade

At **Institution E,** the librarian leads a pilot and expansion process for PBL units. This process has occurred multiple times since the librarian implemented PBL programming. Now, all of the classes in each grade participate in the same or similar librarian-led PBL units each year. Contacts note that even once librarians roll out a PBL unit to many classes, the librarian can adapt the unit to meet the unique needs of each teacher or class.

Pilot and Expansion Process of PBL Units at *Institution E*



Assessment

Consider Written or Oral Assessments to Gauge the Impact of Library Instruction on Student Learning

At **District D**, librarians build formative and summative assessments into each curricular unit during summer sessions for curriculum development. These assessments range from written reflections or quizzes to individual and class discussions with the librarian. Each assessment allows the librarian to compare student growth to a predetermined student learning objective. The assessments also drive planning processes for creating new units or adapting preexisting lessons. Additionally, students receive a grade for their work during instructional library periods. The librarian publishes these grades on student report cards and therefore communicates the grades to students' parents. District D uses this grade to communicate the importance of learning in the library to teachers, administrators, and parents.

Contacts Observe an Increase in Student Engagement after Implementing Library Instruction

Contacts at **District D** and **Institution E** credit the inclusion of student choice and active learning in library instruction for the observable increase in student engagement following library instructional periods. Contacts report that among students, parents, and teachers, library initiatives have shifted perspectives away from considering the library as a place to hold books toward considering the library as a place of academic learning and exploration. Librarians and administrators at District D also use social media to promote this shift in thinking and elevate the work of librarians across the district. Contacts at Institution E believe PBL units have also made students more comfortable learning in the library and utilizing library resources.

4) Research Methodology

Project Challenge

Leadership at a member institution approached the Forum with the following questions:

- What initiatives do contact elementary school libraries organize to improve academic achievement?
  - What initiatives, if any, do contact elementary school libraries organize to improve science achievement, in particular?
- What are the primary components of contact elementary schools' library initiatives?
- Who is the target audience for contact elementary schools' library initiatives?
- What time commitment do the library initiatives require from stakeholders?
- Who at the contact elementary schools oversees the library initiatives?
- What resources do contact elementary schools' library initiatives require?
- How do contact elementary schools fund profiled library initiatives?
- What initial steps did contacts take to launch the initiatives?
- Which metrics or strategies do contact elementary schools employ to assess the success of library initiatives?
- What impact on academic achievement, if any, have contacts linked to library initiatives?
- How do contacts communicate the value of library initiatives to school and district stakeholders?
- What challenges have contacts faced during the development and implementation of these initiatives? How did contacts overcome these obstacles?
- What advice would contacts offer a school district seeking to better leverage their library to improve academic achievement?

Project Sources

The Forum consulted the following sources for this report:

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- The Chronicle of Higher Education (http://chronicle.com)
- National Center for Education Statistics (NCES) (http://nces.ed.gov/)
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- "What is Project Based Learning (PBL)?" Buck Institute for Education. Accessed October 12, 2017. https://www.bie.org/about/what_pbl

Research Parameters

The Forum interviewed administrators and librarians at public schools in the United States.

A Guide to Institutions Profiled in this Brief

School	District	Location	Approximate Student Population (School/District)
Institution A	**District A**	Mid-Atlantic	700/3000
Institution B	**District B**	Mid-Atlantic	700/5,000
Institution C	**District C**	South	800/45,000
Institution D	**District D**	Mid-Atlantic	N.A./110,000
Institution E	**District E**	Midwest	550/11,500