

RTI'S APPROACH
TO SUPPORTING HIGH-QUALITY

PROJECT-BASED LEARNING

IN SCHOOLS

ON NOVEMBER 30, 2017, MORE THAN 250 STUDENTS, PARENTS, SIBLINGS, AND COMMUNITY MEMBERS ARRIVED AT YADKIN VALLEY REGIONAL CAREER ACADEMY IN LEXINGTON, NORTH CAROLINA. THIS WAS NOT THE BIGGEST FOOTBALL GAME OF THE SEASON. IT WAS, HOWEVER, WHAT PRINCIPAL JONATHAN BROWN CALLS VALLEY'S SUPER BOWL – THEIR FALL 2017 EXHIBITION.



During this academic exhibition focused on showcasing student PBL work, Math II students in Ms. Murchison's class explained to visitors how they built ParaboDROIDS, droid prototypes designed and built based on the parabolic measurements of everyday objects, including styrofoam cups and plastic bottles. The students built their prototypes and collected data using a variety of methods to determine the quadratic equation of best fit for each of the objects used in their designs. Once prototypes were complete, Math II students collaborated with the Technology Engineering and Design (TED) class, who used the ParaboDROIDS to learn how to use programs for 3D printing. TED students used exact measurements, coding, draft plans, and 3D printers to print and build working droids from the prototypes.



In the same room, the Foundations of Math students explained how they used algebraic functions— linear, exponential, and quadratic—to analyze, replicate, and paint science fiction landscapes, or “Mathscapes,” modeled from Star Wars films. These Mathscapes, along with some of the completed ParaboDROIDS, were then used in Communications I classes as backgrounds and props for short stop-motion films.



Down the hall, in Mr. McDade’s science classroom, students described how they used drones to photograph and measure the terrain in front of the school to create garden designs for an on-site community garden. Students first sought input by designing a school-wide survey to ensure that the garden would meet school community needs. Based on the results of the survey, the plans now include both outdoor and indoor classroom space that will be built by the students.

The Valley Fall Exhibition not only showcased the semester’s student projects, but it also showcased the power of project-based learning (PBL), an approach to learning that uses real-world and relevant contexts to engage all students in sustained, inquiry-based learning. Beginning with a driving question to frame the unit, PBL promotes inquiry and critical thought by requiring students to define problems, formulate relevant questions, analyze and evaluate information, create and refine products, and present and defend their work to a public audience. The PBL approach provides the opportunity for all students not only to learn content, but also to turn that content knowledge into relevant, real-world applications that engage them in action-oriented work.



“Working with RTI has been the best investment our school has made. The support we receive for our teachers from our instructional coach is second to none.”

- Jonathan Brown, Principal, Yadkin Valley Regional Career Academy



RTI'S CENTER FOR EDUCATION SERVICES SUPPORTS SCHOOLS AND DISTRICTS AS THEY IMPLEMENT A PBL APPROACH.

We partner with educators as they adopt and/or refine their PBL approach. The following core characteristics guide our approach and support successful outcomes, regardless of our partners' context or level of PBL experience.



EMPHASIS ON CUSTOMIZABLE SUPPORT

Effective support for professional learning in schools cannot be a one-size-fits-all approach. We begin PBL support with a tailored needs assessment. The needs assessment process includes data collection, classroom walk-throughs, surveys for teachers and school leadership, and input from students to identify existing strengths and opportunities for growth and learning. Based on an

analysis of these data, our team partners with school-based staff to co-develop a customized approach to PBL that blends professional learning with on-site and virtual coaching. This strategic approach is designed to target the unique needs of each school context.



CONNECTIONS TO THE REAL WORLD

Making learning relevant to students increases engagement and is a core component of effective PBL. We connect educators to research that is current and ongoing. These connections are used to model the practice of using relevant and timely global issues during PBL professional learning sessions. This shifts teachers from simply planning projects to planning projects that ask students to engage with real-world issues, problems, and processes. We emphasize the extension of projects beyond classroom walls through global and local community connections and invite students and educators to engage with our own scientists.



Through RTI’s “STEM Career Panels” and “Students at Work” initiatives, students are able to interact with Scientists at RTI in a variety of career domains to learn about education and work experiences.

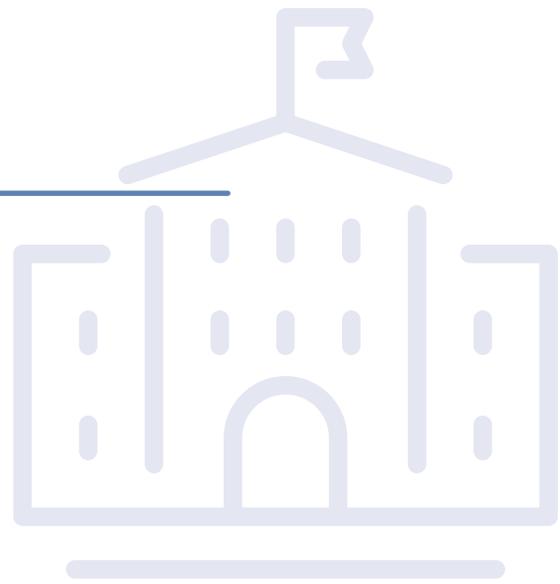
“I think we can all imagine ourselves back in our early high school and college days going through the motions, attempting to figure out what it is that we’re called to do with our careers,” said RTI environmental engineer Meaghan McGrath who was featured in a recent panel. “Mentoring opportunities like this are vital in helping students (our future workforce!) understand what types of jobs and job settings are out there, the requirements of certain job types, what they’re capable of and what variety of things they can aspire to within their chosen field.”

“The value of the RTI Career Panel is that students see how STEM careers apply to the real world beyond the classroom setting,” said teacher Dawn Blankenship whose high school class participated in a recent panel.

A LEARNING CULTURE

For PBL to be successful, educators need more than a PBL template or planning tool. Successful PBL implementation requires the appropriate learning culture. From school administrators to teachers to students, the culture must shift from one of traditional teacher-led instruction to a student-centered approach where student collaboration and creativity can thrive. English and Kitsantas (2013) observed, “In order for the potential of student-centered, inquiry-based approaches to be realized, students must make the shift to their new role as active learners and develop self-regulated learning (SRL) skills” (p. 129). Further, they explain that there is a direct relationship between the classroom environment and students’ abilities to self-regulate.

An emphasis on culture begins with a needs assessment during which teachers and school leaders are asked to reflect on school culture, identifying key components of the culture that are ready to support a PBL model and areas for growth and revision. The essential elements of school culture identified by RTI as conducive to PBL include relationship building (connections and belonging), collaboration, inquiry, student voice and choice, equity, and growth mindset. We believe professional learning for PBL should begin not with how to plan a PBL unit, but with how to shift the culture of classrooms and schools as needed to support a student-centered, inquiry-based approach. Our PBL training includes classroom activities that help students build relationships and learn to work together in collaborative groups prior to the first PBL unit. Training also includes a focus on modeling professional collaboration with strategies and activities that can be replicated in the classroom with students.



ESSENTIAL ELEMENTS OF SCHOOL CULTURE

conducive to PBL include



EMPHASIS ON PROCESS

PBL is not just about the project because much of the learning in PBL occurs through the process of inquiry, during which students investigate, explore, and discover new learning to develop an informed response to a central driving question. Through this process of inquiry and discovery, students learn to work collaboratively through multiple iterations of their PBL products. They learn to evaluate themselves and others, solve problems, and refine their work. According to one teacher in a study conducted by MIDA Learning Technologies (2016), “it was not about ‘did they get the right answer, but it was about the process and how they did the work’” (Speziale et al., p. 37). This emphasis on process requires a shift in teacher thinking toward a student-centered, inquiry-driven approach that is supported through both professional learning sessions and ongoing coaching.

“Process” includes not only the student’s process of inquiry but also how the teacher designs and executes powerful PBL units. Our approach to professional

learning includes topics to support the project management and ongoing assessment of PBL that not only ensures students will be successful in their learning, but also supports teachers in planning for, organizing, and tracking student growth. The MIDA study found that, “Measuring intangible processes is indeed more difficult than measuring attainment of content knowledge through memorization and subsequent testing based on recall of facts” (Speziale et al., p. 37). Through project management tools and a focus on formative assessments and peer and self-reviews, RTI emphasizes the learning process inherent in an effective PBL unit and supports teachers as they learn to measure intangible processes in addition to content knowledge.





AFTER PROFESSIONAL LEARNING

<20%

of teachers implement new learning
without additional follow-up

95%

of teachers implement new learning
with sustained coaching

SUSTAINED COACHING

Whereas fewer than 20 percent of teachers implement new learning after a workshop or professional learning session without additional follow-up, 95 percent of teachers implement new learning following a workshop or professional learning session with sustained coaching (Bush, 1984). We believe an effective professional learning model emphasizes one-on-one follow-up coaching to provide teachers with additional support in implementing PBL and to tailor that support to the needs of each individual teacher.



Sustained coaching for teachers is important, and so is coaching and consulting for leaders. Our approach integrates support for school and district leaders as they consider local context and make data-driven decisions about how to integrate, implement, and support PBL in their schools or district communities. We recognize that *sustained* is not always *sustainable*; so we work with schools and districts to build local capacity through peer coaching structures as well as more formalized PBL coach development programs.

YADKIN VALLEY

REGIONAL CAREER ACADEMY

**EARLY
COLLEGE
HIGH SCHOOL**

**200
STUDENTS**

**9-13
GRADE**

Yadkin Valley Regional Career Academy (Valley) is an early college high school serving just over 200 students in grades 9–13. Students at the school are enrolled in traditional high school classes as well as college-level classes and have the opportunity to graduate from high school with an associate’s degree and/or industry credentials. Valley, established in 2012 with a focus on providing education services to first-generation college students, began as a “wall-to-wall” PBL school and emphasizes career pathways and local workforce opportunities. In fall 2016, Valley engaged RTI for continued PBL support.

Work at Valley began with a comprehensive needs assessment. As a part of the assessment, RTI staff

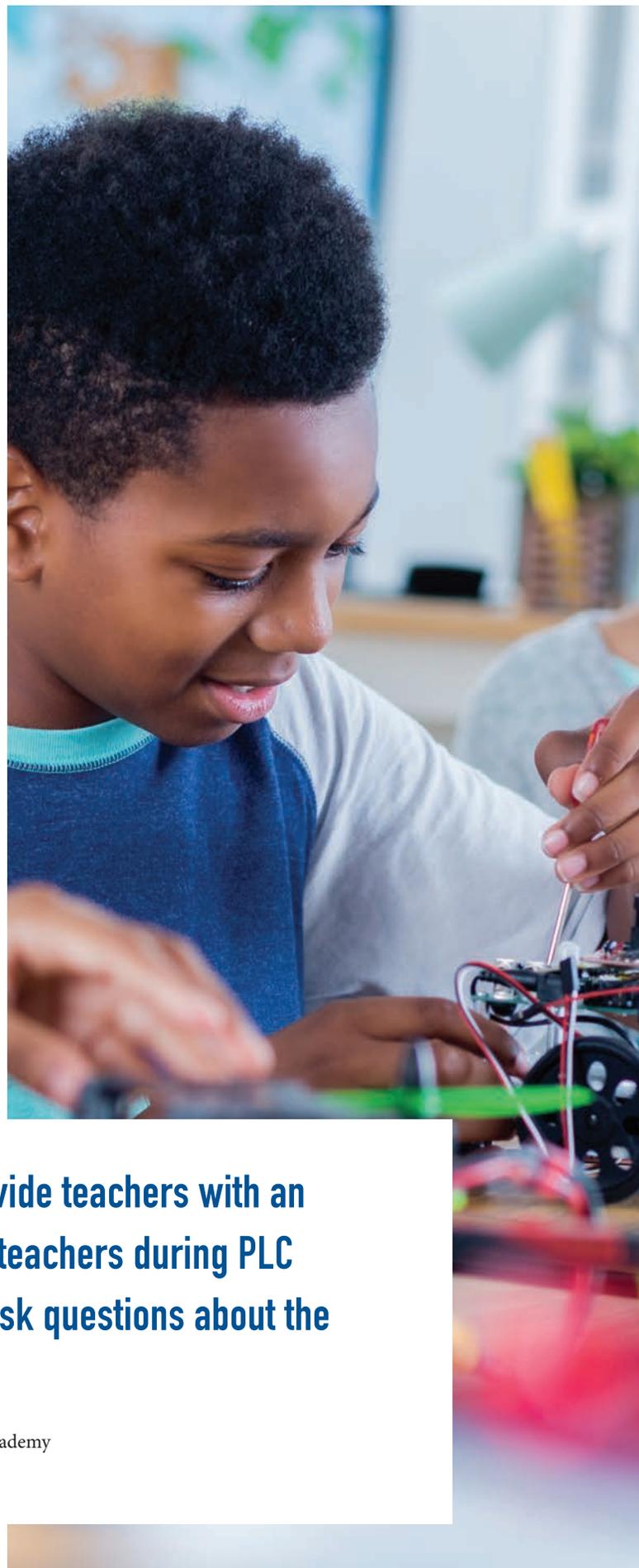
conducted walk-throughs, surveys with staff, and interviews with students and the principal, Jonathan Brown, to assess the current level of PBL in the school. All Valley teachers had some PBL experience. There was a wide range of comfort with and knowledge of PBL across the school, and teachers implemented PBL in a variety of ways. Based on the needs assessment, Valley’s goal emerged: to strengthen their use of PBL design and implementation through a common approach and increased professional collaboration. Developing a common approach and a common language with an emphasis on professional collaboration as the foundation would support the growth of cross-curricular PBL units, the next step for Valley’s PBL program.

To address Valley’s needs, RTI provided specialized coaching and consulting services to orient teachers to common PBL tools designed to ensure an aligned planning approach and shared PBL language. With these tools in place, RTI provided training in teacher-to-teacher lesson tuning, building upon the existing PBL culture to facilitate collegial relationships and to increase instructional rigor in PBL units.

According to Valley’s onsite PBL coach, Cindy Winters, sustained coaching has provided an opportunity for both school leadership and teachers to utilize an outside perspective to refine their work through a partnership approach. During coaching sessions, our highly skilled coach partners with teachers to tune unit plans, gather evidence on implementation, and guide reflection on implementation. Additionally, the RTI coach continues to partner with Mr. Brown and Ms. Winters to design a strategic approach to increase staff capacity through professional learning. Winters said, “[our RTI coach] has been able to provide teachers with an outside perspective. He has met with teachers during PLC meetings to listen to their ideas and ask questions about the logistics of their projects.” In addition, RTI’s support has included opportunities to connect with other schools like Valley. Winters said, “He has suggested other schools where we have been able to make contacts that are similar to us. We are different from other schools in our district and it is nice to see that we are not just an island.”

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-Cindy Winters, Onsite PBL Coach, Yadkin Valley Regional Career Academy



A photograph of three students in a science laboratory. They are gathered around a table, looking intently at a large glass beaker filled with a yellow-orange liquid. The student in the center is a young man with dark hair, wearing a blue polo shirt. To his left is a young woman with glasses and a green shirt. To his right is another young man with dark hair, also in a blue shirt. They appear to be engaged in a hands-on learning activity.

JOHNSTON COUNTY PUBLIC SCHOOLS

46
SCHOOLS

2400
TEACHERS

36000+
STUDENTS

Johnston County Public Schools is comprised of 46 schools and over 2,400 teachers. RTI began collaborating with the district in the summer of 2016 to support systemic, district-wide change for students. Johnston County Public Schools' 2020 strategic plan includes making instruction more engaging and more personalized. To meet this end, the district is beginning to adopt competency-based education along with a PBL approach. To scale the PBL approach over three years, Johnston County identified 100 teachers—elementary, middle, and high school—to participate in the first cohort of teachers to implement PBL in the district with RTI's training and support.

To ensure that professional learning met the needs of teachers in the first cohort, their needs assessment

included a self-assessment for individual teachers regarding key aspects of their PBL experiences and classroom culture. Based on the results of the survey, RTI customized a weeklong summer workshop on PBL to meet teachers' needs. During the workshop, teachers discussed PBL culture, learned foundational PBL strategies, and designed their first PBL units.

According to Dana Jernigan, Director of Professional Development for Johnston County Schools, the RTI emphasis on intentional building the culture of PBL was one of the reasons Johnston County chose the RTI model of PBL professional development. She noted, "One of the main reasons our district selected to partner with RTI was the first-day overview of mindset. Teachers spent a day

exploring the components and culture of a PBL classroom [for example] from teacher-centered to student-centered. Understanding how the role of the teacher changes is foundational as high-quality projects are designed.”

Johnston County’s professional learning not only focused on culture, but it also modeled an emphasis on connections to the world beyond the classroom. The workshop opened with educators engaging as epidemiologists to seek out solutions to the world’s Zika crisis. Starting with a driving question that asked how they could stop the spread of the Zika virus, participants engaged with resources from the Centers for Disease Control and Prevention, World Health Organization, and others to investigate the virus and the challenges faced in stopping its spread.

Sustained coaching in Johnston County has continued to build the foundation of a PBL culture and provide tools to enhance the process. RTI coaches meet with cohort teachers to refine, implement, and reflect on PBL units. For Colleen Bonner, a World History teacher, this sustained coaching has emphasized the importance of the PBL process for her students. Bonner felt that she used projects in her classroom often before the PBL training; however, through training and coaching, her own process has changed. She says a project “used to be just an overview. Students finished, I graded. [There was] not a ton of personal reflection, but now I see the kids growing—they said they haven’t done as much work before but it’s good work. I get to know kids better, [and] everyone is more invested.”

Follow-up training for the first cohort has occurred with more than 60 teachers focused on reflection on initial implementation, additional culture building and project implementation, and a deeper dive into assessment. A second and third cohort of teacher development is now underway. Cohort capacity has also had to be expanded due to high teacher interest. To support further sustainability of the model, RTI coaching staff supported Johnston County Schools’ Teaching and Learning Coaches (TLCs) by providing training on coaching for effective PBL implementation, and by including district TLCs in on-site PBL coaching sessions with teachers.

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-Dana Jernigan, Director of Professional Development for Johnston County Schools



HIGH QUALITY PROJECT-BASED LEARNING

As evidenced by the energy, excitement, and engagement of Valley students during their exhibition and the staff-driven momentum in Johnston County, PBL can be a powerful approach to teaching and learning that prepares students for life in the 21st century. Customized support that emphasizes process, a culture of learning, connections to the real world of global research, and a sustained coaching approach, empowers educators to use PBL as a tool to transform schools and create lasting student success in a rapidly changing world.



RESEARCH ON PBL FINDS THAT WHEN WELL IMPLEMENTED, PBL HAS LED TO



INCREASED
student motivation engagement



INCREASED
content knowledge



INCREASED
content skills



INCREASED
development of collaborative
skills



IMPROVED
critical thinking and problem
solving skills



INCREASED
student achievement in high
poverty communities



“One thing RTI does a really good job of is customizing support to what each group needs. Not just at the district level, the support is very specific to where participants are starting from. It’s an intentional process to understand where the group is and taking it from there.”

-Kathy Price, Executive Director of Educator Effectiveness, Johnston County Public Schools

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