The Peoples Academy Sustainable Communities class with their answers to the question "what makes a community sustainable?" on the final day of class.

Project-based Learning: Whole Class Thematic Investigations

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Abstract

Just as we now acknowledge that students require "flexible pathways" to success, educators and schools also require flexible pathways to success in fulfilling the expectations of Act 77, depending on their context and level of readiness to institute change. While many students can and do generate workable personalized learning plans and carry out meaningful and rigorous self-designed studies, other students have trouble identifying interests and relevant inquiry questions, designing activities, setting goals, organizing their work, and carrying a plan to fruition. For these students, Project-based Learning (PBL) in the context of a whole class thematic learning experience can offer meaningful entry points into authentic personalized learning. This paper provides a brief overview of the research on Project-based Learning, identifies some of the benefits and challenges, and features a narrative of a team-taught, whole class project around the theme of "Sustainable Communities."

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Just as we now acknowledge that students require "flexible pathways" to success, educators and schools also require flexible pathways to success, depending on their context and level of readiness to institute change. It can be challenging to make the leap from a conventional form of education to a more personalized system. The aim of personalized learning transcends "curriculum differentiation" or "individualized instruction," models in which the adult attempts to tailor curriculum content and instructional design to the interests of the child, but remains in control of the learning. Personalization is intended to be in the hands of the students, not imposed, but freely chosen and designed according to the self-identified interests of the young person. While there is no shortage of narratives about students with compelling interests and passions who generate workable plans and carry out personally meaningful studies, other students have trouble identifying interests and relevant inquiry questions, designing activities, setting goals, organizing their work, and carrying a plan to fruition. For these students, it can be helpful if the teacher or teachers take a more active role in the design and facilitation of the learning in order to scaffold the skills necessary to carry out truly independent work.

Peoples Academy students visit the Vermont Packinghouse in Springfield, Vermont .

Project-based learning (PBL[1]) is an old idea that has gained new life as educators seek ways to provide meaningful opportunities to personalize the curriculum, engage students more fully in their learning, and foster active connections in local communities. Historically, project-based learning is associated with both William Heard Kilpatrick (author of "The Project Method" [1918]) and John Dewey (1938), whose ideas about experience and education influenced practitioners for much of the 20th century. These two men differed on the details, in that while Kilpatrick was a whole-hearted advocate for student initiated, designed, and directed projects, Dewey felt strongly that the teacher had a stronger role to play in the fostering of cognitive

> "…the Project Method links **purpose and democracy.**"
>
> —John L. Pecore

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1. PBL as an acronym is used for Problem-based Learning as well as Proficiency-based Learning. While all of these methods are related, they are not interchangeable. In this paper, PBL will refer to Project-based Learning.

growth, and should take a leading role in the development of the project. The narrative featured in this paper is perhaps more illustrative of Dewey's point of view, as it demonstrates a high-level involvement of teachers in helping students build bridges towards a truly personalized curriculum.

Projects may be carried out by individuals, by small groups, by whole classes, or by entire schools. There are innumerable possibilities for educational projects, but strong projects have some things in common:

- A project involves multiple and extended activities over time, connected by a common purpose or theme.

- A project draws upon diverse academic subject matter and/or is "transdisciplinary."

- Generally, projects are organized around central driving questions that are complex, authentic, and of relevance to the learner.

- A project involves planning, design, inquiry, activity, feedback, and reflection.

- Projects require the on-going acquisition of knowledge and skills.

- Usually, projects result in a publically presented, culminating event or a product.

Projects appeal to students because learning takes place in the context of real-life activity and involves the *application* of learning, not just textbook work. Projects may take a number of different forms, including (but not limited to) meeting community needs, service learning, design of material artifacts, place-based inquiry, aesthetic productions and performances, creation of games, political engagement, etc. Group projects require communication, collaboration, shared interests, decision-making, peer teaching, creativity, and critical thinking – all of which are important "21st century skills." Group projects also address some of the limitations of personalized learning, in that learning goals are shared and knowledge is fostered through social interactions and the negotiation of meanings.

Skillfully executed, group projects can open up many "pathways to personalization" for individual students.

Research findings on Project-based Learning

Research on the effectiveness of PBL is mixed, but for the most part positive. For a comprehensive review of the many facets of PBL, see (Thomas, J.W., 2000). A more recent study attempts to update the findings in the 2000 paper, and while this paper generally supports the earlier findings, it concludes by suggesting that PBL is "promising but not proven" (Quint & Condiffe, 2018). Some of the difficulty in establishing *conclusive* research about the effects of PBL is related to these points: 1) there is no one PBL design that is common to practitioners, 2) there is little information about how PBL fits in with other instructional methods (i.e. cooperative learning, demonstrations, etc.), 3) there is no definitive answer to how much student choice and direction is optimum, and 4) there is little information on how to assess learning of such complex educational activity. Rather than see these as reasons not to engage in PBL, practitioners might take heart in the opportunity

to experiment with design and implementation, understanding that the choices they make about all of these elements are by necessity related to their unique context and to the interests and capacities of both themselves and their students. Some highlights of the existing research:

- PBL has been shown to foster positive student learning outcomes in the areas of content knowledge, engagement and motivation.

- PBL often results in improved attendance, advanced self-reliance, and enhanced attitudes toward learning, including greater acceptance of responsibility for learning.

- PBL provides for increased development of complex cognitive skills (i.e., higher-order thinking, problem-solving, collaborating, and communicating).

- PBL supports access to a broader range of learning opportunities for engaging culturally diverse learners.

- PBL can support the learning of a range of students with special and/or differing needs.

- Group-based PBL supports the development of collaborative skills, and can provide opportunities to view events and situations through multiple perspectives and engage in conflict resolution.

Challenges of Project-based Learning

Critics of PBL tend to raise concerns about the acquisition of knowledge in the forms of facts and concepts. In some studies, for example, students engaged in PBL have tended to perform lower on standardized tests, and PBL did not convincingly improve their knowledge base. In other studies, however, test scores in skills *and* content increased dramatically. Studies that indicate a failure to adequately cover content *do not* generally address the question of whether knowledge acquired in conventional ways is retained, or if it can be applied, issues that are positively addressed by more robust, experiential learning activity. The criticism however, does highlight the importance of considering creative and effective ways to seamlessly weave in strong academic content to PBL.

Even if we are convinced that PBL is the way to go in terms of engaging students in strong learning, there are a number of challenges that teachers can face at the level of school policy: requirements to adhere to curriculum guidelines or mandates, pacing calendars that dictate how much time can be spent on a concept or topic, and testing policies that need to be negotiated. While some teachers may have to struggle to overcome barriers such as these, other challenges at the level of the classroom lend themselves to creative problem solving: building in adequate time for project completion, choreographing classroom activities to provide for both group and individual work time, finding the sweet spot between teacher control and student direction, organizing the flow of and access to information, building scaffolds that support students of a variety of skills and capacities, using technology to enhance cognition, and designing (or co-creating) authentic assessment to measure student understanding. These challenges will be addressed in the narrative of practice that follows.

Whole Class Thematic Investigations – A Narrative of Practice

Peoples Academy, established in 1847, sits on a hill at the eastern edge of Main Street and overlooks the historic village of Morrisville to the west. Its neo-classical façade is impressive, with an entrance bay flanked by Corinthian columns. Inside, the high ceilings, natural light, and wooden floors hearken back to an earlier, simpler era when elocution, nature study, and the Palmer Method of penmanship constituted the curriculum. But Peoples Academy is very much a 21st century school, and has been a leader in enacting the innovations required by Act 77. Designated a *High School on the Move* in 2000, it has made steady progress implementing proficiency-based graduation requirements, personalized and community-based learning experiences, and flexible pathways to graduation.

Kate Toland, a high school social studies teacher, is a leader in these efforts at her school and in the state. She is very committed to the idea that learning is most effective when students have a use for it and refuses to simply "pile in information" despite the pressures of a national education culture that values the acquisition of "facts" over deeper understandings. No novice at PBL, last year she and her Geography students explored their physical community and made a documentary film to share with the public. Kate feels that the production of videos is a compelling way for students to document and share their learning, and to prepare herself to provide the necessary technical support, she took a course at the Vermont Folklife Center on how to facilitate ethnographic field study with her students and support them in creating and using video data.

> "I learned that everything is very interconnected, and that **in order to solve problems, communities have to come together and share diverse perspectives** on the issues."
>
> —Aidan, student in Sustainable Communities class (view his video at bit.ly/ALVideo2018)

Kate's colleague Matt Yoskowitz is a science teacher at Peoples Academy. Kate and Matt share an interest in environmental and social/cultural issues and have taught units on sustainability in their individual courses. For two semesters, they designed and co-taught a course on *Sustainable Communities* that creatively combines whole class thematic group learning and personalized, individual projects. In the process, they learned a great deal about interdisciplinary planning and teaching, how to best support students in personalized research projects, and how to foster deep and lasting learning. The data for this narrative was gathered through a review of curriculum materials for the class, class visits, in-depth interviews with Kate and with selected students, and a look at some of the culminating products.

The "hook" that draws students into this topic is a whole class brainstorming session in which they identify all of the things that make a community socially, environmentally, and economically sustainable[2], and ask themselves to what extent does their community embody these factors? Their insights were wide ranging and mature, including everything from health care, job opportunities and livable wages, to safety, open green spaces, affordability, emergency services, availability of healthy food, and solid infrastructure. In the first part of

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2. The social, the environmental, and the economic (people, planet, and profits) are considered the "three pillars" of sustainability.

the course, Kate and Matt share models of sustainability with their students, and in order to design a frame for the analysis of sustainability, the students take many whole group field trips to food coops, food producers, and various farms, businesses and social services.

In the classroom, students work together on acquiring practical research skills such as how to interact with people in the community, how to set up meetings, how to design good interview questions, and how to actually do interviews. These teachers recognize that doing this sort of fieldwork takes a lot of preparation, and students engage in simulation interviews, taking on various roles and practicing being both interviewer and interviewee. No detail is too insignificant to escape modeling and coaching: How does one work up the courage to make a cold call to a potential informant? How do you learn to ask for what you need? How do you make schedules and confirm them? Above and beyond these practical details are higher level research tasks: how does one frame an interview and stay focused? What is the best way to structure an experience? How does one prepare informants for the interview? How does one consider an experience as "text?" How does a researcher look for codes and patterns in their data?

Peoples Academy student Liv Foster takes the lead interviewing Selina Rooney, an organic dairy farmer on the Rooney Farm in Morristown, Vermont.

In the second part of the course, students initiate their own investigations into some aspect of their community. Two students, Aidan and Adele, identified the opioid epidemic occurring in so many rural communities as an important topic to explore. Both students carried out in-depth interviews, often in tandem, with doctors, law enforcement personnel, counselors, and other community members involved in the issue. As they entered the phase of how to craft a final product for their research, Adele chose to look more closely at the process of recovery from opioid addiction, including access to and availability of support. What made her project especially powerful was her sensitive, in-depth video of her interview with a woman recovering from addiction. It should be obvious that this public "exposure" of a person's recovery took the project to a whole new level, necessitating learning about research ethics, confidentiality, permissions to use data, etc. Aside from learning many qualitative research skills, this student gained some important insights about her community:

> *I learned that it is important to have a strong community so that people feel comfortable talking about the hardships that some of the members struggle with. I learned that it is important to not hide and brush off the scary stuff, because it is also the important stuff.*

Aidan also created a video which incorporated audio from an interview with a woman recovering from opioid addiction overlaid with music and moving images of a snowy Vermont

winter, invoking a poignant sense of place and an awareness of how issues of poverty, economics, rural isolation, and generational trauma intersect in the social problem of addiction. Aside from the technical skills of learning to use video, photographs and text to tell a compelling story, he acquired the ability to *think systemically* about a pressing social problem and attributed this learning to the "systems-mapping" process he learned in the class. He noted that his research was "eye-opening, profound, like nothing I had ever experienced in a school setting before." Even more important, perhaps, is his deep understanding of how a community can solve its problems: "I learned that everything is very interconnected, and that in order to solve problems, communities have to come together and share diverse perspectives on the issues."

One strategy students identified was to raise public awareness of important community issues through creating stickers with compelling messages.

Another student, Jacques, descended from many generations of Vermont hunters, chose to focus on hunting and conservation in Morrisville. Though already a skilled hunter of deer, bear, turkey, and small game birds such as partridges, he was interested in questions of sustainability as they relate to the practice of hunting. He interviewed game wardens, foresters, hunters and local townspeople. He made many recordings and learned the painstaking process of transcription. In the context of gathering information, he learned about ecology and the carrying capacity of the land, about land management, about Vermont's loss of species such as wolves and catamounts, and how stewards of the land can best compensate for these disruptions to the overall equilibrium of ecosystems. He most enjoyed his interviews at the "Old Fishing Hole" a local store that caters to fishermen/women and hunters, and here learned a valuable lesson about how knowledge can be found not just in textbooks, but in people's narratives of experience.

This two-semester curriculum encompassed many dimensions of learning. The course began with a focus on whole group teaching that included both knowledge and skill development. It should be noted that during this time a number of guest speakers visited, and each student was able to pose questions to the speakers that connected to their personal interest in sustainability. In this way, the students gained an initial glimpse into the systemic nature of social problems. The students then branched off to explore their own research questions about aspects of sustainability in their community. As a culminating event, parents and the community came together to appreciate the sharing of all of the various projects, and engage in the rich discussion of how their community could be made more sustainable. To further the understanding of the interlocking nature of all of the inquiries, the final exam required each student to make a "systems map" of the interconnections of all of the problems that they researched. All of these "dimensions of learning" (identifying a topic, developing research

questions, designing a study, collecting data, analyzing evidence, mapping interrelated systems, understanding the components of sustainability, sharing findings, etc.) were assessed in multiple ways (including self-assessment) using detailed rubrics.

Summary

INTEGRATED LEARNING. In project-based personalized learning, the teacher takes on many different responsibilities: role model, questioner, coach, guide, co-investigator, time manager, and interdisciplinary scholar. In regards to this latter role, Kate has discovered that she needs to understand the "edges of her discipline." In this model, a teacher cannot rely solely on a textbook for content, but needs to understand the many connections that can be forged out of experiences, connections that may take both students and teacher outside of their "content comfort zone." Traditional *Disciplinary* learning is characterized by modes of thinking and learning specific to a field of study (i.e. Biology, History). Students acquire *knowledge* (concepts, theories, etc.) specific to the discipline, learn *methods of inquiry* that characterize the field, learn about the *purposes* of the discipline and what kinds of problems it addresses, and become familiar with *forms of expression* of the discipline. *Interdisciplinary* learning calls upon the integration of the methodology and language of two or more disciplines to inform a learning experience in a way that generates conceptual connections and new knowledge (i.e. the Philosophy of Science). *Transdisciplinary* learning engages with knowledge produced that is not explicitly connected to one or more academic disciplines and it usually signifies real world origins. *Integrated* learning embodies aspects of these different pedagogical approaches, but it goes further in that it implies student interest, choice, and collaborative design in their learning. (See VTLFF, 2019 for a set of relevant rubrics on integrated learning). This whole class theme immersion in "sustainable communities" exemplifies the best qualities of all of these pedagogical approaches in that it embodied rich academic learning in the content areas, brought those content areas into conversation with each other, explored real world issues and problems, and maximized student control over the individualized portion of the inquiries.

View Aidan's video at **bit.ly/ALVideo2018**

The team teaching situation is the ideal model for fostering such multi-dimensional learning experiences. Kate and Matt were able to add richness and depth to their support for the students' projects with their combined expertise in science and the social studies. Kate notes an unanticipated consequence of their work together: "while we were teaching/learning with the students **we** often began to learn more comprehensively/more holistically about the world." She goes on to remind us that "the intellectual work of interdisciplinary study is challenging and needs to be done with an open mind, with colleagueship, low risk of being seen as ignorant, and the constant chase/pursuit of deep understanding of the world." In addition to these "habits of mind" necessary to doing meaningful interdisciplinary/integrated work, there are nuts and bolts issues that must be addressed within a system. Of primary importance is the need for common planning time – not winging it with a few exchanges in the corridors – but time to "pause to make sense of our questions and think about next steps or just the concepts we were trying to teach and also understand more deeply ourselves."

SUPPORTING PERSONALIZED LEARNING. It is also crucial to know students well, in order to "draw out" (Latin: *ēdūcere*) those authentic interests and genuine questions that should form the foundation of personalized learning. Finding the sweet spot of appropriate challenge is important: "Key to project method success is the skilled teacher guiding the student through the process such that the student takes as much ownership as possible over each step so as to provide a healthy level of stress but prevent discouragement from too great a level of difficulty" (Pecore, 2016, p. 159). Kate notes that it can take a lot of time to assist a student in discovering what it is they are interested in and how to craft a meaningful study out of their interests, but it is worth the effort: "You really need to trust that a child's interest is going to lead them somewhere." She would be the first to acknowledge that students achieve success at many different levels, and that not all students really "get it." But then, she reminds us, "not all students 'get it' in the conventional classroom either."

Kate spends an enormous amount of time outside of school hours supporting the research her students are doing. She reports, in a class on Vermont Government, accompanying one girl after school on a Friday night who was doing the rounds with the Sheriff, taking video footage of the event for the student, and then spending nine hours of a Sunday figuring out how to upload the video for the student. It's not that all teachers don't spend an enormous amount of work time outside of school hours – according to Kate, it's just that how she spends this time "looks different." She often scouts community learning sites, and makes test runs with a student before a formal visit.

> "I learned that it is important to have a strong community so that **people feel comfortable talking about the hardships** that some of the members struggle with."
>
> —Adele, student in Sustainable Communities class

Teachers who promote PBL are willing to put in the extra time and self-study because they have discovered that PBL offers deeper learning than conventional methods. Some parents believe that "projects" generate less learning than their child might gain through traditional approaches — studying a textbook and taking quizzes, with a larger comprehensive test at the end of the course. This belief represents a deeply rooted "mental model" about how young people learn that focuses on the basic cognitive skills of memory and recall. For example, a core concept in the social studies is that values and opinions can be shaped by disinformation and propaganda in the media. One can "learn" this idea simply by reading the former sentence. But for the student doing the project on law enforcement and the local Sheriff's office, it wasn't until she began extensive editing on her own video footage that she fully realized how the creative juxtaposition of words and images could present messages that might easily influence a viewer. This insight may have taken longer than merely reading the statement and perhaps being tested on it. But one cannot compare the surface acquisition of a fact with the deeply felt and complex understanding arrived at through first-hand experience. While PBL and other forms of experiential learning may *seem* inefficient compared to conventional methods, Depth of Knowledge – DOK (Webb, N. 2005), a kind of update of Bloom's Taxonomy (Bloom, 1956; Anderson & Krathwohl, 2001), rates engagement in extended projects at the highest level on its scale of cognitive complexity, due to the needs to consider multiple sources of information, apply knowledge gained to concrete situations, think and process information over time, analyze various causes and factors, and synthesize what is learned in a culminating product or event.

Research has found that one of the key implementation challenges for PBL "involved teachers' willingness to change their role in the classroom and alter their conceptions of classroom control" (Condiffe, et al, 2017, p. 23). This is a reminder of the importance of teacher self-reflection (what do I believe about how young people learn?) and "pedagogical values clarification" (what is most important for students to know and be able to do?). Teacher beliefs play a big part in how successful they feel with PBL. Research has demonstrated, for example, that the extent to which a teacher believes in the importance of cultivating the "transferable skills" (in Vermont, these standards include clear and effective communication, self-direction, creative and practical problem-solving, responsible and involved citizenship, and informed and integrative thinking), rather than worrying about standardized test scores, have an easier time implementing a PBL approach (ibid. p. 23). Alongside these individual aspects of becoming a PBL teacher is the importance of collaboration. The most successful implementation of PBL offers teachers many opportunities for shared planning, interdisciplinary co-teaching, professional consultation, collective inquiry, and the sharing of results.

COLLEGE, CAREER, AND CITIZENSHIP READINESS. Projects are uniquely suited to get students engaged in their communities, explore career options and think about how they might contribute to society when they become adults. However, when considering PBL, it's important to keep in mind one of John Dewey's more famous quotes, from Article II of his "Pedagogic Creed": "I believe that education, therefore, is a process of living and not a preparation for future living" (in Dworkin, 1959, p. 22). The strength of PBL is that it can fulfill both the social aims of preparing students for life after schooling *and* the deeply felt desires of young people to engage in learning that is relevant to their *current* needs and interests — learning that is grounded in real life experiences and connects to relevant issues in the world. As one researcher notes, PBL illustrates "progressive education in practice by involving students in meaningful learning opportunities connected to the world in which they live. Project method links purpose and democracy" (Pecore, 2016, p. 157). Understood in this broader frame, we can see that when implemented thoughtfully and skillfully, PBL can help prepare students for the task of becoming citizens in a very complex and rapidly changing world. Both Dewey and Kilpatrick saw PBL as strongly related to democracy. For Dewey, who understood democracy to be not merely a form of government, but a way of living/being together, education necessarily involved the social tasks of communication, collaboration, the development of shared interests and the awareness of one's actions on others. For Kilpatrick, the "project method's greatest strength is the potential for building moral character, with students acting in pursuit of a rich variety of purposes, individually or collectively, under the supervision of a skilled teacher to help guide students to make increasingly finer discriminations of right and proper ideas and judgments" (Pecore, 2016, p. 159). Projects then, when conceptualized with rigor, relevance, and careful consideration of how to best connect action, inquiry, and academic content, can serve much larger purposes than the acquisition of bits of knowledge upon which a student is tested and graded. They have the potential to positively impact our social world and enhance our democratic life, as students acquire the "21st century [transferable] skills" that now form the basis of Vermont's educational aims.

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