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# Online Tools for PBL

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In project-based learning (PBL), collaboration takes many forms. Teachers and students work together to start and finish projects. Students work collaboratively with one another to share ideas, build understanding, and complete projects. Teachers discuss ideas, share best practices, and look for

inspiration from other teachers. Students and teachers work with outside stakeholders to make learning relevant and authentic. With the emergence and popularity of educational technology, online tools present new ways for teachers and students to collaborate on PBL.

## Collaboration and Project-based Learning

Collaboration is an essential element of PBL. Barron and Darling-Hammond (2008) include collaboration within their definition of PBL: “Students explore real-world problems and challenges, developing cross-curriculum skills while working in small collaborative groups” (p. 11). Collaboration helps participants in classrooms distribute tasks and take advantage of multiple areas of expertise. The whole group can do more than the individual student or teacher (Hemlo-Silver, 2004).

PBL, with its emphasis on skills such as collaboration and communication, fits nicely with the recent push toward a 21st century curriculum. In my own teaching practice, I view



collaboration, whether it be teacher-teacher, student-teacher, student-student, or classroom-community, as one of the most important components of a project. Teacher Susan Jerrell (2015) writes that collaboration is a game changer, as “you will never look at teaching the same way again.”

## Online Collaboration and Project-based Learning

Educational technology (edtech) is an increasingly important facet of school life for both teachers and students. The growth of edtech has led to the development of many online tools for various purposes and audiences (Wan and McNally, 2015). Technology integration is a very common, although not absolutely necessary, feature of PBL. Edtech provides the means for stakeholders to find resources, build knowledge, create products, and connect with people near and far.

Although edtech serves a number of purposes within projects, this monograph will specifically focus on the role that online collaborative technologies can play in promoting PBL best practices. Specific practices and methods are paired with a variety of online tools. I will provide examples for four different online collaboration pathways: teacher-teacher, student-teacher, student-student, and classroom-community. Keep in mind that the lists of practices, methods, and online tools that follow are just a starting point.

This monograph focuses on four different collaboration opportunities: teacher-teacher, student-teacher, student-student, and classroom-community.

## Teacher-Teacher Online Collaboration in PBL

Whether you are a beginning teacher or have years of PBL experience, connecting with other teachers is beneficial to



improving practice. Dynamic teacher collaboration aids project creation, implementation, and reflection (Krajcik, J. S., Blumenfeld, P. C., Marx, R. W., & Soloway, E., 1994; Goodnough, 2010). Online tools allow teachers to move beyond the four walls of their classrooms and collaborate with other teachers outside their own schools. Teachers can connect with other teachers around the world, for example using social media, blogs, email, and video conferencing.

## Development - Project Ideas and Feedback

In the process of developing a project it can be very helpful (and inspiring) to collaborate with other teachers. Some teachers may ask for the advice of others in determining project ideas for a specific topic. For example, a middle school social studies teacher may ask an online community to suggest a PBL idea for a curricular topic related to “Egypt.” Some teachers may ask for feedback on a promising driving question or emerging concept.

Tools:

- Social Media (Twitter - #pbl #pblchat hashtags)
- Online Communities and Discussions
- PBL Google+ Community (<https://plus.google.com/communities/105127936409761280514>)
- Edutopia PBL Discussion (<http://www.edutopia.org/topic/65260/discussions>)
- Edmodo PBL
- Collaborative Documents (Google Documents, Quib)
- Video Conferencing (Skype, Google Hangout)



## Resources - Sharing and Finding Resources

PBL stresses deeper learning and increased learner control (Bray and McClaskey, 2015). As students take greater control over their learning, teachers act as curators, facilitators, and coaches, sometimes for content they are unfamiliar with. Teachers also endeavour to find 'how-to's' or 'tutorials' that help students build a product to demonstrate learning. Sharing and editing collaborative collections of resources is valuable for teachers who are completing similar projects.

Tools:

- Collaborative Documents (Google Documents, Quib, TitanPad)
- Wiki Software (WikiSpaces)
- Online Notebooks: (Evernote)

## Sharing - Telling Your Story and Publishing Work

Blogs and social media give teachers a voice and the opportunity to share their ideas as 'local experts' (Schiller, 2015). Whether sharing successes or explaining difficulties, sharing one's PBL story provides teachers with the opportunity to invite others to join their journey. A quick post showcasing a successful project may prompt another teacher to post about a similar project in the comment section. Similarly, a post that shares a project stumbling block may lead to a conversation with another teacher who is facing a similar challenge.

Tools:

- Social Media (Pinterest, Twitter, Instagram, Facebook)



- Blogs (Blogger, Google Sites, EduBlogs, Medium, WordPress, Weebly)

## Teacher-Student Online Collaboration in PBL

In PBL, students and teachers work together to co-construct knowledge. The teacher does not simply transmit knowledge one way to students. The relationship between teacher and student is one of co-learners. This relationship stresses a collaborative mode of interaction.

### Assessment - Formative Assessment and Reflection

Larmer and Mergendoller (2015) write that, “throughout a project, students - and the teacher - should reflect on what they’re learning, how they’re learning, and why they’re learning.” Formative assessment allows teachers to monitor

The Buck Institute for Education ([bie.org](http://bie.org)) identifies reflection, critique and revision as essential elements of “Gold Standard PBL.”

and improve student learning while a project is still in progress. Online tools help turn formative assessment into a collaborative opportunity.

Tools:

- Monitor Learning through Backchannel and Chat (TodaysMeet, Backchannel Chat)
- Voice Tools (Vocaroo, Voice Comments Google Documents App, Kaizena)
- Collaborative Documents (Google Documents, Quib, TitanPad)
- Checkins (Socrative, Kahoot, Poll Everywhere)



## Resources - Sharing and Finding Resources with Students

Teachers and students collaborate to curate and share resources. Teachers provide students with essential content or tutorials. Students suggest and add materials they find through inquiry. Sharing and editing collaborative collections of resources is valuable to both teachers and students.

Tools:

- Collaborative Documents (Google Documents, Quib, TitanPad)
- Wiki Software (WikiSpaces)
- Online Notebooks: (Evernote)
- Learning Management Systems (EdModo, Schoology)

## Task Management - Scheduling and Deadlines

Online calendars and 'to-do' lists allow both teachers and students to set deadlines, make suggestions, and capture tasks. This allows teachers to keep track of a project team's progress, while allowing students the autonomy to add their own deadlines and checkpoints.

Tools:

- Online Calendars (Google Calendar, Sunrise Calendar)
- Online Lists and Task Managers (Trello, Asana, Wunderlist, Todoist, Slack)
- Learning Management Systems (EdModo, Schoology, Google Classroom)



## Student-Student Online Collaboration in PBL

In my personal experience, the strength (or weakness) of student collaboration can make or break a project. To be good collaborators students must know how to act as part of an academic team. Students need to negotiate ideas, problem solve effectively, and acknowledge the knowledge and talents of other team members (Hemlo-Silver, 2004).

In her investigation of student groups Barron (2003) concludes that, “groups that did well engaged the ideas of participants, had low rates of ignoring or rejecting, paid attention to attention, and echoed the ideas of one another” (p. 349). Students will often need help to collaborate effectively and online tools can aid student teamwork.

### Recording Thoughts and Ideas - Brainstorming and Mind Mapping

It is essential for students to have a place to populate, document and showcase their thoughts and ideas. While it is hard to beat an old-fashioned post-it note, online tools store and archive the brainstorming process allowing students

to access ideas anytime. Online tools also give everyone a voice. If each student has the ability to post a note, the conversation has a greater opportunity to be shared.

Tools:

- Online Corkboard/Canvas (Padlet, Lino)
- Mind Maps (Popplet, Coggle, LucidChart, MindMesiter)
- Online Whiteboard (Explain Everything, Educreations)
- Collaborative Documents (Google Documents, Quib, TitanPad)



## Research - Recording Notes and Research

Most projects make time for considerable student research. Even when research is not an explicit project requirement, students still need to gather resources and ideas. Thankfully, online tools make it easy for students to collect research and share it with their classmates.

Tools:

- Collaborative Documents (Google Documents, Quib, TitanPad)
- Online Corkboard/Canvas (Padlet, Lino)
- Wiki Software (WikiSpaces)
- Online Notebooks (Evernote)

## Creation - Making Products

Creativity is much more than adding color to maps or making a poster. Creativity is about giving students the power to create. PBL gives students the power to create ideas, create solutions, and create knowledge. Often times, students create a product to showcase their deep knowledge and understanding of a project topic. There is no shortage of online tools that allow students to create an end product.

Tools:

- Presentations (Google Slides, Canva, Haiku Deck, Powtoons, PiktoChart, eMaze)
- Videos (WeVideo, Adobe Voice, iMovie, Stop-Motion Studio)
- Podcasts (GarageBand, Soundation, Vocaroo)
- Code (Scratch)
- Visuals and Digital Posters (ThingLink, Canva, PicCollage, Smore, PosterMyWall)





- Stories and Comics (BookCreator, ZooBurst, BitStrips, Pixton)
- Blogs and Websites (Blogger, Google Sites, EduBlogs, Medium, WordPress, Weebly)

## Classroom - Community Online Collaboration in PBL

PBL is not confined to the four walls of a classroom. In fact, PBL seeks to make learning relevant and meaningful by engaging students with 'real world' processes, problems, and contexts. Projects can be designed to have a 'real' impact on the world and others (Larmer and Mergendoller, 2015). In order to engage students at this level, it is necessary to identify an authentic audience to present to and/or collaborate with. This audience may include experts and mentors who are consulted throughout the project lifecycle plus a public audience to whom the final product is showcased. Larmer and Mergendoller (2015, p. ddd) write that, "like authenticity, a public product adds greatly to PBL's motivating power and encourages high-quality work." This type of school-community collaboration is not always common in schools, but online tools can open up such connections in new and exciting ways.

A public showcase can be a very powerful event for teachers, students, and the wider community.

### > Risk/Rewards

Online collaboration is not without risk. Online tools allow for a remarkable amount of collaboration and creation, but they also open up the debate about student privacy. Before using an online tool, make sure you understand it. There are many online tutorials and blogs devoted to the safe and responsible use of online technologies. Familiarize yourself with the pitfalls of particular tools. Remind students that digital citizenship and



privacy protection are important considerations. Show them how their PBL work will establish a positive digital footprint. Model the appropriate use of technology by establishing your own positive digital profile. Approach mistakes as learning opportunities and teachable moments.

## Authentic Audience - Identifying Experts, Mentors, and Partners

The teacher does not need to have a world class rolodex to identify and incorporate an authentic audience. Many authors, scientists, and world class performers can be contacted through Twitter. Other experts maintain blogs where they regularly communicate with readers. Skype, Google Hangout, and other video conferencing technologies can potentially bring university professors and subject experts into the classroom with a few emails. It might even be possible to poll parents and the community for potential contacts who are willing to donate their time. Online tools allow for collaboration with people near and far.

Tools:

- Social Media (Twitter)
- Surveys (Google Forms, TypeForm, SurveyMonkey)
- Video Conferencing (Skype, Google Hangout, Facetime)

## Sharing - Showcasing and Sharing Products

Sharing work with an authentic audience starts with conducting meaningful work. If a project is meaningful and relevant, if it connects with the 'real' world, avenues for sharing products are likely to make themselves available. It is also important to ask students how they want their work to be



shared. Posting work to a blog or website can serve as a low cost way of sharing work.

Tools:

- Social Media (Pinterest, Twitter, Instagram, Facebook)
- Blogs (Blogger, Google Sites, EduBlogs, Medium, WordPress, Weebly)

## Conclusion

Maintaining an open, yet critical view of educational technology will allow the benefits of online collaboration to shine through. Online collaboration tools help promote PBL best practices, while motivating students and teachers. The sky is often the limit with many of these tools. Don't be afraid to think big, to sometimes fail, and then to try again. Your students' success will ultimately make up for any bumps along the way.

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## About the Author

Timothy Monreal is a middle school teacher in Columbia, South Carolina. He recently moved from Los Angeles to begin PhD studies in Educational Foundations and Inquiry at the University of South Carolina. He is a cofounder of online PBL platform CrowdSchool and blogs at [beardedteacher.blogspot.ca](http://beardedteacher.blogspot.ca).

## Discussion Questions

1. What are the four different collaboration relationships mentioned near the beginning of the monograph? Identify one online collaboration tool you would like to try for each relationship. Are there any additional online collaboration tools, not mentioned in the monograph, that you have used or heard about?
2. What are some additional risks to using online collaboration tools? How might you turn a specific risk into an opportunity?
3. Think about the last project you completed. How might you have used online collaboration tools to improve the project's end result?
4. In your opinion, what is the biggest struggle students face in terms of PBL collaboration? How might the use of online collaboration tools help students improve their collaboration?