

Improving Problem-Based Learning with Asynchronous Video

Richard E. West

In 2015, Deloitte surveyed nearly 8,000 millennials about the skills needed for work. One of the conclusions of this investigation was that higher education did not prepare these millennials with many of the skills they needed for their actual careers as much as learning on the job did.

Collectively, higher education said, "Ouch."

This does not mean higher education is not important in preparing students for their careers, but it does suggest that we need to reconsider our strategies. Some evidence suggests that problem-, inquiry-, or project-based teaching methods can more effectively prepare students for the kinds of problems and projects they will face in their careers. In short, we can better prepare students to bridge the skills gap.

What is problem-based learning? It can refer to a very specific method developed by Howard Barrows.^{Footnote1} However, I will use the term more broadly to refer to a collection of strategies that focus on providing students with authentic, real-life problems related to their discipline. Students are presented an authentic problem and given support as they work together to solve it. In doing so, they get to practice in school the kinds of decision-making they will do in their careers—but in a safe environment where failure is less consequential. This can help them develop both content knowledge and critical thinking skills.^{Footnote2}

Problem-Based Learning

Here is the challenge, though: how can you support problem-based teaching strategies when you are teaching online? When courses move online, quite frequently they regress toward teacher-centered strategies in which the instructor records a lecture, students read a textbook or online articles, and then the class discusses their thoughts in a discussion board or through video discussions. Although this is not necessarily ineffective teaching, it is incomplete without additional problem-centered activities. But how can instructors support, guide, and develop collaboration and problem-based thinking strategies online?

One possible strategy to help support effective problem-based learning (PBL) is to use asynchronous video—video communication that is recorded when the participants want to record the video instead of all at the same time, as happens in videoconferencing. Similar to videoconferencing, asynchronous video can help develop relationships of trust and connection among the members of a problem-solving team. This sense of connection is critical to collaboration, and particularly key to team creativity,^{Footnote3} because connection is a prerequisite to developing trust within a team, where each team member feels psychologically safe sharing their ideas. This psychological safety is one of four key facets that Neil Anderson and Michael West found contributed to a positive team climate for innovation, along with a shared group vision, a commitment to excellence by each team member, and support for innovation in the organization.^{Footnote4} Because asynchronous video can communicate nonverbal cues, we have found in our research that it can deepen this sense of connection and community.^{Footnote5}

Besides deepening a sense of connection, asynchronous video can support problem-based learning in two other ways: first, by communicating more information about the problem context, and second, by facilitating effective team communication.

Asynchronous Videos as Triggers for Problem-Based Learning

Good problem-based instruction begins with a good trigger, or an authentic problem, described in its context. Often these triggers are written case studies, but providing visual context is important too. Before asynchronous video was common, instructors often provided images as part of problem-based learning triggers. More recently, though, researchers have studied how video can benefit PBL and discovered that video triggers can be more motivating, are preferred by many students, and can help them develop more realistic understandings of the problem.^{Footnote6}

As an example, one team of scholars at the University of Hong Kong studied the PBL sessions of students who received text triggers versus those who received video triggers. They found that those who were prompted by video spent less time simply defining and identifying the problem and more time exploring the solution—and students developed better observational and reasoning skills.^{Footnote7} In other words, they understood the problem quicker and were able to more efficiently move toward solving the problem. As these scholars explained about the use of video as a trigger in medical education, "Video may be a better medium because it preserves the original language, encourages the active extraction of information, avoids depersonalization of patients, and allows direct observation of clinical consultations. In short, it exposes the students to the complexity of actual clinical problems."

Using Asynchronous Video to Support Team Interactions



Image CC-BY/SA from www.lumaxart.com/

Aside from serving as a trigger to start students on their problem-solving activity, asynchronous video can also be helpful in managing group interactions. A well-known problem with group creativity is the danger of falling into groupthink, in which the group coalesces too quickly around an idea without individual thinking, analysis, and questioning. This can be particularly problematic in synchronous situations, such as in-person discussions or live video

conferences, because after one person in the group offers a suggestion, it becomes difficult, cognitively, for students to *not* think about that suggestion and instead consider new ideas. To combat this problem, team leaders will often ask members of the team to first identify their own ideas and rank them, prior to meeting together where the team can discuss the ideas and reach consensus.



When team members are asked to develop their own ideas independently, the team is less likely to fall into groupthink. Because of the danger of groupthink, using asynchronous video can be an effective strategy for initial group brainstorming discussions by asking team members to first submit video responses showing their ideas for solving the problem before then viewing their peers' videos. In addition, because asynchronous video slows down the conversation, participants may be more thoughtful in their responses, especially if they can delete their response and resubmit a revised idea.

Using video in problem-solving teams has also been shown to help overcome cultural barriers—asynchronous video carries the added benefit of allowing team members who speak other languages to replay or slow down the video to improve comprehension.^{Footnote8} Many tools also allow for qualitative analysis of asynchronous video to sort portions of video into different themes/topics, which can help leaders or team members better evaluate and improve team processes. Also, in some situations, it may be helpful to have students create videos as the outputs of their problem-solving exercise in order not only to better communicate their PBL outputs but also to be able to explain their problem-solving processes and thinking.^{Footnote9}

Finally, an important member of any problem-solving team is the instructor, who can provide advice, mentoring, context, and other forms of assistance. Because problem-solving teams within the same class may be working on different timelines, different problems, or at different paces, asynchronous video can be helpful for allowing these student teams to ask the instructor for assistance when they need it. The nature of video may also allow the instructor to more quickly engage in the brainstorming process with students than through text.

Asynchronous Video: A New Frontier in Problem-Based Learning

As new technologies have emerged in the past few years, asynchronous video is becoming easier to use in more and varied ways. This is a new frontier, and much research is still needed to understand its potential effects. For example, while some research has found that video can deepen critical thinking and comprehension for students, other studies have argued the opposite, perhaps because the video contains distracting elements.^{Footnote10} Also, while students in

some studies said they like the use of asynchronous video, students in other studies prefer text communication or triggers.^{Footnote11}

This variability is not surprising. The research in this area is still very new, and students often have differing preferences for how and when they prefer to engage in education. What is important, though, is for teachers to use a variety of methods for engaging their students and to explore when, where, and why these different methods can support the students they teach. For this reason, asynchronous video is an intriguing addition to the standard approaches already used to support problem-, project-, and inquiry-based learning.

Acknowledgment

This chapter was written with the support of EdConnect and previously published at <https://er.educause.edu/blogs/2021/2/improving-problem-based-learning-with-asynchronous-video>.

Notes

1. Andrew Walker, Heather Leary, Cindy Hmelo-Silver, and Peggy A. Ertmer, eds., [*Essential Readings in Problem-Based Learning: Exploring and Extending the Legacy of Howard S. Barrows*](#) (West Lafayette, IN: Purdue University Press, 2015).
2. Cindy E. Hmelo-Silver, ["Problem-Based Learning: What and How Do Students Learn?"](#) *Educational Psychology Review* 16, no. 3 (2004): 235–266.
3. Jill E. Nemiro, ["Connection in Creative Virtual Teams,"](#) *Journal of Behavioral and Applied Management* 2, no. 2 (2001).
4. Neil R. Anderson and Michael A. West, ["Measuring Climate for Work Group Innovation: Development and Validation of the Team Climate Inventory,"](#) *Journal of Organizational Behavior* 19, no. 3 (1998): 235–258.
5. Rebecca A. Thomas, Richard E. West, and Jered Borup, ["An Analysis of Instructor Social Presence in Online Text and Asynchronous Video Feedback Comments,"](#) *The Internet and Higher Education* 33 (April 2017): 61–73; Jered Borup, Richard E. West, and Rebecca Thomas, ["The Impact of Text versus Video Communication on Instructor Feedback in Blended Courses,"](#) *Educational Technology Research and Development* 63, no. 2 (April 2015): 161–184.
6. Päivi M. Rasi and Sari Poikela, ["A Review of Video Triggers and Video Production in Higher Education and Continuing Education PBL Settings,"](#) *Interdisciplinary Journal of Problem-Based Learning* 10, no. 1: (April 2016); Bas A. De Leng, D.H. Dolmans, M.W. Van de Wiel, A. M. M. Muijtjens, and Cees Van der Vleuten, ["How Video Cases Should Be Used as Authentic Stimuli in Problem-Based Medical Education,"](#) *Medical Education* 41, no. 2 (March 2007): 181–188.
7. Lap Ki Chan, Jingyan Lu, Mary S.M. Ip, and Amber L.M. Yip, ["Effects of Video Triggers on the PBL Process,"](#) in *Problem-Based Learning in Clinical Education*, eds. Susan Bridges, Colman McGrath, and Tara L. Whitehill (Springer Science+Business Media, 2021): 139–150; Lap Ki Chan, Nivritti G. Patil, Julie Y. Chen, Jamie C. M. Lam, Chak S. Lau, and Mary S. M. Ip, ["Advantages of Video Trigger in Problem-Based Learning,"](#) *Medical Teacher* 32, no. 9 (2010): 760–765.
8. Cindy E. Hmelo-Silver, Jiyoung Jung, Susanne Lajoie, Yawen Yu, Jingyan Lu, Jeffrey Wiseman, and Lap Ki Chan, ["Video as Context and Conduit for Problem-Based Learning,"](#) in *Educational Technologies in Medical and Health Sciences Education*, eds. Susan Bridges, Lap Ki Chan, and Cindy E. Hmelo-Silver (Springer International Publishing Switzerland, 2016): 57–77.
9. Päivi Hakkarainen, ["Promoting Meaningful Learning through Video Production-Supported PBL,"](#) *Interdisciplinary Journal of Problem-Based Learning* 5, no. 1 (2011): 4.
10. Hee Jun Choi and Scott D. Johnson, ["The Effect of Problem-Based Video Instruction on Learner Satisfaction, Comprehension, and Retention in College Courses,"](#) *British Journal of Educational Technology* 38, no. 5 (2007): 885–895; Robin Basu Roy and Graham T. McMahon, ["Video-Based Cases Disrupt Deep Critical Thinking in Problem-Based Learning,"](#) *Medical Education* 46, no. 4 (April 2012): 426–435.
11. Robin Holding Kay and Ilona Kletskin, ["Evaluating the Use of Problem-Based Video Podcasts to Teach Mathematics in Higher Education,"](#) *Computers & Education* 59, no. 2 (September 2012): 619–627.





This content is provided to you freely by EdTech Books.

Access it online or download it at

https://edtechbooks.org/asynchronous_video/improving_problem_based_learning.