



Professional Development Institute

Flex Course Syllabus

Creating a Dynamic Classroom through Project-Based Learning (K-5)

PDI Course Number: 116T02

ACE Course Number: LE5762

UCSD Course Number: EDUC40298

If you would like information about receiving credit for completing this course, [please click here](#).

Course Timeline

Participants have one year to complete the course. Participants must spend a minimum of three weeks in this course.

Course Description

Does the phrase *project-based learning* seem entirely foreign to you? Perhaps you've heard about it but it seems much too complicated to incorporate into your current teaching practices? The good news is that it doesn't need to be. Also known as PBL, project-based learning is a great way to engage students so that they are challenged to use their higher-order 21st century skills as they collaborate to learn content in a fun and exciting way. This online course is designed for K-5 teachers who are looking to explore how PBL can fit into their current curriculums. In doing so, students become immersed in the guided inquiry process. As they work through a variety of projects, they become critical and creative thinkers and communicators who are able to work collaboratively while embracing what has become known as Gold Standard PBL. This course begins by discussing the role that PBL plays in 21st century learning. As teachers progress through the course, they will take a deep dive into each of PBL's essential components. Teachers will learn how to effectively implement each of the components throughout several content areas, including reading, math, science, engineering, and social studies. Teachers will learn strategies for establishing a PBL mindset in their classrooms and they will learn how to "marry" some "out of the box" strategies within the PBL framework. By the end of this course, teachers

will feel more confident and successful in their quest to implement project-based learning into their own teaching practices.

Educational Outcomes

1. Teachers will learn how project-based learning (PBL) factors into 21st century learning.
2. Teachers will understand what PBL is, including some of its most common misconceptions.
3. Teachers will understand the difference between project-based learning and problem-based learning.
4. Teachers will learn about the various components of Gold Standard PBL.
5. Teachers will learn strategies for crafting their own Driving Questions for the PBL projects.
6. Teachers will learn some general active learning strategies that can be applied to the PBL framework.
7. Teachers will learn specific strategies for establishing a culture of inquiry and creativity within their PBL classrooms.
8. Teachers will learn best practices for properly structuring their PBL classroom.
9. Teachers will learn how to establish positive classroom norms which are conducive to a positive PBL classroom climate.
10. Teachers will learn specific strategies in order to build a positive PBL classroom climate.
11. Teachers will understand the principles of inquiry-based instruction and how guided inquiry relates to the PBL process.
12. Teachers will learn how to ask different types of questions in order to elicit more engaged responses from students.
13. Teachers will learn how to create a PBL project from the ground up.
14. Teachers will learn how to fit PBL into an elementary literacy program, either fully, partially, or separately.
15. Teachers will learn and understand the various steps involved in the PBL process.
16. Teachers will learn how to adapt their instruction for PBL by designing their lessons using a backwards approach.
17. Teachers will learn how to establish a PBL mindset in their reading classrooms, and they will be given specific resources and activities to use to help students become more logical and deductive thinkers.
18. Teachers will learn how PBL stimulates students' close reading skills, an important 21st century skill.
19. Teachers will learn specific strategies for stimulating students' 21st century reading skills.
20. Teachers will learn how to use "out of the box" tools and strategies such as pen pals and simulations in conjunction with their PBL projects.
21. Teachers will learn about the nine habits of numeracy and how they fit into the overall PBL framework.
22. Teachers will learn the steps involved in the problem-solving process and will understand how to apply them within mathematical project-based learning.
23. Teachers will learn specific strategies and activities for implementing PBL within mathematics.

24. Teachers will learn specific strategies and activities for implementing the engineering design process so that students begin to think like “real” scientists and engineers.
25. Teachers will understand the specific principles needed for an effective STEM/PBL lesson, and they will be introduced to several resources and strategies to help them implement PBL lessons within the STEM framework.
26. Teachers will learn about the different approaches to PBL, including how Genius Hour can be used in conjunction with PBL in order to stimulate students’ STEM skills.
27. Teachers will learn how to successfully implement the PBL process into their STEM classrooms.
28. Teachers will learn about growth mindset and will understand its importance to project-based learning.
29. Teachers will understand how to combine instructional simulations with project-based teaching within the context of social studies.
30. Teachers will learn how to incorporate various forms of technology into their PBL projects, including such things as podcasts, virtual field trips, and scavenger hunts.
31. Teachers will learn specific strategies and be introduced to several examples of how to incorporate PBL into their social studies classroom.

Instructional Media

- Online Discussions
- Online Engagement
- Online Collaboration
- Instructor Feedback
- Instructor Interaction
- Online Resources and Websites
- Supplemental Instructional Materials
- Printable Classroom Resources

Evaluation

- Test #1 (5% of final grade)
- Test #2 (5% of final grade)
- Test #3 (5% of final grade)
- Test #4 (5% of final grade)
- Test #5 (5% of final grade)
- Autobiography and Goals for the Course (10% of final grade)
- Article/Video Reflection (15% of final grade)
- Course Collaboration/Share Ideas with the Class (10% of final grade)
- Cumulative Assignment/Project: Design Four PBL Projects (20% of final grade)
- Culminating Practicum (20% of final grade)

Topical Outline

Unit One

- The Role of PBL in 21st Century Learning
- Setting the Stage for Project-Based Learning
- Breaking Down Project-Based Learning
- **Assignment #1**
Write an autobiography including information about yourself, your grade level and what you specifically hope to learn about incorporating project-based learning into your teaching practices. Your autobiography should be a minimum of three paragraphs.
- **Test #1**

Unit Two

- Establishing a Culture of Inquiry and Creativity
- The Basics of Guided Inquiry
- How to Create a PBL Project from the Ground Up
- **Assignment #2**
As an educator, it is important to be aware of the research, studies, and professional work done in the field. In the course, you will find an article and video that are relevant to the specific course content. Read the article and then write an essay with your thoughts.
- **Test #2**

Unit Three

- Establishing a PBL Mindset in the Reading Classroom
- Stimulating 21st Century Skills
- The Power of Pen Pals as a PBL Project
- **Assignment #3**
Online Discussion Board Participation/Engagement: Please post a tip, strategy, or idea that specifically relates to effectively incorporating project-based learning into the classroom. The tip, strategy, or idea that you share needs to make a difference to other teachers in their own classrooms. Your assignment should be a minimum of three paragraphs and detailed enough for another teacher to follow easily. This is a great opportunity to share and collaborate with other teachers at your grade level around the country. Take time to review and respond to other postings that are relevant to your classroom population in order to gain effective ideas to use immediately in your classroom
- **Test #3**

Unit Four

- Reasoning Mathematically
- The Art of Solving Problems
- Project-Based Learning in the Math Classroom
- **Test #4**

Unit Five

- Thinking Like a Scientist or Engineer
- Integrating STEM into Project-Based Learning
- Project-Based Learning in Science and Engineering
- **Test #5**

Unit Six

- Making Projects Authentic through Simulations
- Incorporating Technology into Social Studies Projects
- Project-Based Learning in the Social Studies Classroom
- **Assignment #4**

Choose a typical problem or activity and turn it into a PBL project instead. You will do this for four different topics which are separate and distinct from one another. When you are finished, you will have created four separate PBL projects. Each of the PBL projects should be appropriate to your grade level and should follow the principles of Gold Standard PBL. All the activities contained within the projects should be inquiry-based and include hands-on, experimental learning which is (for the most part) student-led. Be sure to include the grade level(s) and content area to which each project best applies. Follow the instructions and example given in Assignment 4.

- **Assignment #5**

The culminating practicum is a three-step process. (1) In the first assignment, you were asked what goals you had and what you hoped to learn from the course. Think back to your original goals for this course. Write a minimum two-paragraph reflection specifically describing how what you learned can be used to help you reach those goal(s). (2) Next, write a minimum three-paragraph plan that specifically describes the ways in which you intend to implement a particular strategy you learned in this course into your own teaching situation. (3) Last, write a minimum two-paragraph reflection describing a student you have or have had in the past. Then, discuss how the strategies you learned in this course will specifically benefit that student as you put your plan into action.

Bibliography

- Advancement Courses (2016). "Unique Activities to Get Kids Thinking Like Scientists." Retrieved 15 May 2020 from <https://blog.advancementcourses.com/classroom-activities/get-kids-thinking-like-scientists/>
- Akhondi, M., F. Aziz Malayeri, & A. Abd Samad (2011). "How to Teach Expository Text Structure to Facilitate Reading Comprehension." Retrieved 23 April 2020 from <https://www.readingrockets.org/article/how-teach-expository-text-structure-facilitate-reading-comprehension>
- Alber, R. (2014). "5 Ways to Give Your Students More Voice and Choice." Retrieved 18 May 2020 from <https://www.edutopia.org/blog/five-strategies-more-voice-choice-students-rebecca-alber>
- Ambrose, S.A., M.W. Bridges, M. DiPietro, M.C. Lovett, & M.K. Norman (2010). *How Learning Works: Seven Research-Based Principles for Smart Teaching*. San Francisco, CA: Jossey-Bass.
- American Sociological Association (ASA, 2013). "Fact Sheet: College, Career, and Civic Life (C3) Framework for Social Studies State Standards." Retrieved 22 May 2020 from <https://www.asanet.org/sites/default/files/savvy/documents/students/docs/FINAL%20C3%20Fact%20Sheet%209-13-13-1.pdf>
- Anderson, R.C. (1977). "The Notion of Schemata and the Educational Enterprise: General Discussion of the Conference." In *Schooling and the Acquisition of Knowledge*, R.C. Anderson, R.J. Spiro, & W.E. Montague (Eds.). Hillsdale, NJ: Erlbaum.
- Authentic Education (2015). "What is Understanding by Design[®]?" Retrieved 15 April 2020 from <https://www.authenticeducation.org/ubd/ubd.lasso>
- Beers, K. (2003). *When kids can't read: What teachers can do*. Portsmouth, NH: Heinemann.
- Berger, R. (2003). *An Ethic of Excellence: Building a Culture of Craftsmanship with Students*. Portsmouth, NH: Heinemann.
- Beyer, B.K. (1987). *Developing a Thinking Skills Program*. Boston, MA: Allyn & Bacon.
- Blair, O. (2017). "What comes after millennials? Meet the generation known as the 'Linksters.'" Retrieved 26 March 2020 from <http://www.independent.co.uk/life-style/millennials-generation-z-linksters-what-next-generation-x-baby-boomers-internet-social-media-a7677001.html>
- Boaler, J. (2016). *Mathematical Mindsets: Unleashing Students' Potential Through Creative Math, Inspiring Messages and Innovative Teaching*. San Francisco, CA: Jossey-Bass.

- Bonderud, D. (2019). "How Project-Based Learning is Helping Students Build 21st Century Skills." Retrieved 22 April 2020 from <https://edtechmagazine.com/k12/article/2019/11/how-project-based-learning-helping-students-build-21st-century-skills-perfcon>
- Brooks, A. (2019). "7 Skills Employers Look For Regardless of the Job." Retrieved 15 May 2020 from <https://www.rasmussen.edu/student-experience/college-life/skills-employers-look-for/>
- Brophy, J.E. (2013). *Motivating Students to Learn*. New York, NY: Routledge.
- Bruner, J. (1960). *The Process of Education*. Cambridge, MA: Harvard University Press.
- Buck Institute for Education (2011). *PBL in the Elementary Grades: Step-by-Step Guidance, Tools and Tips for Standards-Focused K-5 Projects*. Novato, CA: Buck Institute for Education.
- Buhrow, B. & A.U. Garcia (2005). *Ladybugs, tornados, and swirling galaxies: English language learners discover their world through inquiry*. Portland, ME: Stenhouse Publishers.
- Chall, J.S. (1967). *Learning to Read: The Great Debate*. New York, NY: McGraw-Hill.
- Cherry, K. (2019). "The Basics of Cognition and Mental Processes." Retrieved 20 April 2020 from <https://www.verywellmind.com/what-is-cognition-2794982>
- Cole, P. (2016). "Bringing Project Based Learning to Life in the Social Studies Classroom." Retrieved 21 May 2020 from <https://www.emergingedtech.com/2016/05/project-based-learning-social-studies-classroom/>
- Committee on Scientific Principles for Education Research, National Research Council (Shavelson, R.J. & L. Towne, eds., 2002). "Scientific Research in Education." Washington, D.C.: National Academy Press. Available at: <https://www.nap.edu/read/10236/chapter/5>
- Conklin, W. (2012). *Higher-Order Thinking Skills to Develop 21st Century Learners*. Huntington Beach, CA: Shell Education.
- Coon, D., J.O. Mitterer, & T. Martini (2017). *Introduction to Psychology: Gateways to Mind and Behavior*. Boston, MA: Cengage.
- Cooper, R. (2017). "Project-Based Learning in Math Class: Easier Than You Think." Retrieved 06 May 2020 from <https://rosscoops31.com/2017/08/29/pblmath/>
- Dam, R.F. & T.Y. Siang (2020). "5 Stages in the Design Thinking Process." Retrieved 19 May 2020 from <https://www.interaction-design.org/literature/article/5-stages-in-the-design-thinking-process>
- Dewey, J. (1897). "My Pedagogic Creed." In *The School Journal*, 56(3), pgs. 77-80.

Duke, N.K. (2016). "Talking About Text Structure in the PBL Classroom." Retrieved 23 April 2020 from <https://www.edutopia.org/blog/text-structure-in-pbl-classroom-nell-k-duke>

Dweck, C.S. (2006). *Mindset: The New Psychology of Success*. New York, NY: Ballantine.

Elementary Teachers Federation of Ontario (ETFO, 2010). *Thinking it Through: Teaching and Learning in the Kindergarten Classroom*. Toronto, Ontario: ETFO. Print.

Erkens, C., T. Schimer, & N.D. Vagle (2019). *Growing Tomorrow's Citizens in Today's Classrooms*. Bloomington, IN: Solution Tree Press.

Esser, J.K. (1998). "Alive and Well after 25 Years: A Review of Groupthink Research." In *Organizational Behavior and Human Decision Processes*, 73(2/3). pgs. 116-41.

Exline, J. (n.d.). "Workshop: Inquiry-based Learning." Retrieved 10 April 2020 from <https://www.thirteen.org/edonline/concept2class/inquiry/index.html>

Fayer, S., A. Lacey, & A. Watson (2017). "STEM Occupations: Past, Present, and Future. Retrieved 18 May 2020 from <https://www.bls.gov/spotlight/2017/science-technology-engineering-and-mathematics-stem-occupations-past-present-and-future/pdf/science-technology-engineering-and-mathematics-stem-occupations-past-present-and-future.pdf>

Fink, L. (2017). "The Relationship Between Writing and Reading." Retrieved 24 April 2020 from <https://ncte.org/blog/2017/12/relationship-writing-reading/>

Fisher, D. & N. Frey (2004). *Improving Adolescent Literacy: Strategies at Work*. Upper Saddle River, NJ: Pearson Prentice Hall.

Fisher, D. & N. Frey (2015). *Text-Dependent Questions: Pathways to Close and Critical Reading, Grades K-5*. Thousand Oaks, CA: Corwin.

Fortus, D., J. Krajcik, R.C. Dershimer, R.W. Marx, & R. Mamlok-Naaman (2005). "Design-based science and real-world problem-solving." In *International Journal of Science Education*, 27(7), pgs. 855-879.

Forward Thinking Curriculum (n.d.). "These social studies webquests will bring the world into your classroom." Retrieved 21 May 2020 from <https://www.forwardthinkingcurriculum.com/social-studies-webquests>

George Lucas Educational Foundation (October 19, 2007). "How Does Project-Based Learning Work?" Retrieved 13 April 2020 from https://www.edutopia.org/project-based-learning-guide-implementation#pbl_question

George Lucas Educational Foundation (December 15, 2015). "Giving Students the Opportunity to Drive Lessons." Retrieved 10 April 2020 from <https://www.edutopia.org/practice/inquiry-based-learning-teacher-guided-student-driven>

Gonzalez, J. (2014). *When We All Teach Text Structures, Everyone Wins*. [online] Cult of Pedagogy. Available at: <https://www.cultofpedagogy.com/text-structures/> [Accessed 23 April 2020].

Gonzalez, J. (2016). "Your Top Ten Genius Hour Questions Answered." Retrieved 19 May 2020 from <https://www.cultofpedagogy.com/genius-hour-questions/>

Good, T.L. & J.E. Brophy (2003). *Looking in Classrooms*. New York, NY: Pearson.

Gorman, M. (2019). "Project Based Learning Done Right: 10 Misconceptions Plus 10 Resources to Help Raise the PBL Bar." Retrieved 31 March 2020 from https://www.techlearning.com/news/project-based-learning-done-right-10-misconceptions-plus-10-resources-to-raise-the-pbl-bar?utm_source=Selligent&utm_medium=email&utm_campaign=4534&utm_content=Tech%26 Learning_eNews_6%2F5%2F19+email%2Etechlearning%2Ecom+&utm_term=&m_i=nPTlp9tvM3n5oSLy9FRvD82bcovEKMS_soENhGmd9xLMW6WgvZjOh62Piy%2BX5cEYIHhEg4Dghx4EyplhnWgN9sa7TBbPdhDnng&M_BT=588936417312

Groves, S. (2001). "Numeracy across the curriculum: Recognizing and responding to the demand and numeracy opportunities inherent in secondary teaching." In *Mathematics Teacher Education and Development*, 3, pgs. 48-61. Print.

Hattie, J. (2012). *Visible Learning for Teachers: Maximizing Impact on Learning*. New York, NY: Routledge.

Johnson, R.T. & D.W. Johnson (1994). "An Overview of Cooperative Learning." Retrieved 08 April 2020 from http://digsys.upc.es/ed/general/Gasteiz/docs_ac/Johnson_Overview_of_Cooperative_Learning.pdf

Keels, V. (2019). "Why Emotional Intelligence is the 21st Century Skill Employees Need." Retrieved 20 April 2020 from https://www.asaecenter.org/resources/articles/an_plus/2019/september/why-emotional-intelligence-is-the-21st-century-skill-employees-need

Krajcik, J.S. & P.C. Blumenfeld (2006). "Project-Based Learning." In *The Cambridge Handbook of the Learning Sciences*. R. Keith Sawyer (ed.). Cambridge, England: Cambridge University Press. Available at: http://daleydoseoflearning.weebly.com/uploads/1/8/7/7/18774020/chapter_19_pbl_kraichik.pdf

Larmer, J. (2012). "PBL: What Does It Take for a Project to be 'Authentic?'" Retrieved 20 May 2020 from <https://www.edutopia.org/blog/authentic-project-based-learning-john-larmer>

Larmer, J. (2014). "Project-Based Learning vs. Problem-Based Learning vs. X-BL." Retrieved 31 March 2020 from <https://www.edutopia.org/blog/pbl-vs-pbl-vs-xbl-john-larmer>

- Larmer, J. (2018). "Project-Based Learning in Social Studies." In *Social Education*, 82(1), pgs. 20-23. Available at: <https://www.socialstudies.org/publications/socialeducation/january-february2018/project-based-learning-in-social-studies>
- Larmer, J., J. Mergendoller, & S. Boss (2015). *Setting the Standard for Project-Based Learning*. Alexandria, VA: Association for Supervision and Curriculum Development.
- LeBlanc, H. (Brainy Apples, Feb. 6, 2018). "Free Simulation: 7 Ways to Step Away from the Lecture Podium & Revitalize Your Social Studies Classroom." [Blog post]. Retrieved 20 May 2020 from <https://www.brainyapples.com/2018/02/06/simulationsinss/>
- Levy, F. & R.J. Murnane (2012). *The New Division of Labor: How Computers are Creating the Next Job Market*. Princeton, NJ: Princeton University Press.
- Lewis, B. (2017). "How to Design a Pen Pal Program for Your Classroom." Retrieved 30 April 2020 from <https://www.thoughtco.com/pen-pal-program-for-your-classroom-2081821>
- Malone, T.W. & M.R. Lepper (1987). "Making learning fun: A taxonomy of intrinsic motivations for learning." In R.E. Snow & M.J. Farr (Eds.), *Aptitude, Learning, and Instruction: Cognitive and Affective Process Analysis*. Hillsdale, NJ: Erlbaum.
- Marzano, R.J. (2010). "The Art and Science of Teaching: Teaching Inference." Retrieved 20 April 2020 from <http://www.ascd.org/publications/educational-leadership/apr10/vol67/num07/Teaching-Inference.aspx>
- McKeown, S., M. Stringer, & E. Cairns (2015). "Classroom segregation: where do students sit and how is this related to group relations?" In *British Educational Research Journal*, 42(1), pgs. 40-55. Available at: <https://onlinelibrary.wiley.com/doi/abs/10.1002/berj.3200>
- McTighe, J. & G. Wiggins (2012). "Understanding by Design Framework." Retrieved 14 April 2020 from http://www.ascd.org/ascd/pdf/siteascd/publications/ubd_whitepaper0312.pdf
- Miami University (2010). "Simulations and PBL in Inquiry Classrooms." Retrieved 20 May 2020 from <http://performancepyramid.miamioh.edu/node/1135>
- Milano, M. (2019). "The digital skills gap is widening fast. Here's how to bridge it." Retrieved 22 April 2020 from <https://www.weforum.org/agenda/2019/03/the-digital-skills-gap-is-widening-fast-heres-how-to-bridge-it/>
- Miller, A. (2017). "Getting Started with Project-Based Learning (Hint: Don't Go Crazy)." Retrieved 13 April 2020 from <https://www.edutopia.org/blog/project-based-learning-getting-started-basics-andrew-miller>
- Mind Tools (2017). "Emotional Intelligence in Leadership: Learning How to be More Aware." Retrieved 20 April 2020 from https://www.mindtools.com/pages/article/newLDR_45.htm

Murray, J. (2020). "The age gap is so beautiful: Coronavirus creates unlikely pen pals." Retrieved 28 April 2020 from <https://www.theguardian.com/news/2020/apr/07/the-age-gap-is-so-beautiful-coronavirus-creates-unlikely-pen-pals>

Muschla, J.A. & G.R. Muschla (2009). *Hands-on Math Projects with Real-Life Applications, Grades 3-5*. San Francisco, CA: Jossey-Bass.

Nagy, W.E. & Scott, J.A. (2000). "Vocabulary Processes." In M.L. Kamil, P. Mosenthal, P.D. Pearson, & R. Barr (Eds.) *Handbook of reading research* (Vol. 3, pp. 269-284). Mahwah, NJ: Erlbaum.

National Council for the Social Studies (NCSS, 1994). *Expectations of Excellence: Curriculum Standards for Social Studies*. Washington, D.C.: NCSS.

National Council for the Social Studies (NCSS, n.d.). "National Curriculum Standards for Social Studies: Introduction." Retrieved 22 May 2020 from <https://www.socialstudies.org/standards/introduction>

National Education Association (NEA, n.d.). "Preparing 21st Century Students for a Global Society." Retrieved 22 April 2020 from <http://www.nea.org/assets/docs/A-Guide-to-Four-Cs.pdf>

NYU Langone Health/NYU School of Medicine. "Brain imaging helps redefine intelligence." ScienceDaily. 13 February 2018.

Ohler, J. B. (2013). *Digital Storytelling in the Classroom* (2nd ed.). Thousand Oaks, CA: Corwin.

Pearse, M. & K.M. Walton (2011). *Teaching Numeracy: 9 Critical Habits to Ignite Mathematical Thinking*. Thousand Oaks, CA: Corwin.

pen pal. In *dictionary.com*. Retrieved 30 April 2020 from <https://www.dictionary.com/browse/pen--pal>

Perkins, D. (2019). "The PBL Mindset for Leadership." Retrieved 20 April 2020 from <https://www.teachthought.com/project-based-learning/the-pbl-mindset-for-leadership/>

Pólya, G. (1945). *How to Solve It*. Princeton, NJ: Princeton University Press.

Ravitz, J., N. Hixson, M. English, & J. Megendoller (2012). "Using project-based learning to teach 21st century skills: Findings from a statewide initiative." Paper presented at Annual Meetings of the American Educational Research Association, Vancouver, B.C. April 16, 2012. Available from:

https://www.researchgate.net/publication/258188193_Using_project_based_learning_to_teach_21st_century_skills_Findings_from_a_statewide_initiative_Jason_Ravitz_Buck_Institute_for_Education [accessed 27 March 2020].

Robinson, K. (TED Talk, February 2006). “Do schools kill creativity?” [Video file]. Retrieved 26 March 2020 from

https://www.ted.com/talks/ken_robinson_says_schools_kill_creativity?referrer=playlist-the_most_popular_talks_of_all

Sandler, J. (2018). “Bringing Social Studies to Life with PBL.” Retrieved 21 May 2020 from

<https://www.edutopia.org/article/bringing-social-studies-life-pbl>

Satchwell, R.E. & F.L. Loepp (2002). “Designing and Implementing an Integrated Mathematics, Science, and Technology Curriculum for the Middle School.” In *Journal of STEM Teacher Education*, 39(3), Article 4. Available at:

<https://scholar.lib.vt.edu/ejournals/JITE/v39n3/satchwell.html>

Savery, J.R. (2006). “Overview of problem-based learning: Definitions and distinctions.” In *Interdisciplinary Journal of Problem-based Learning*, 1(1), pgs. 9-20. Available at:

<https://docs.lib.purdue.edu/cgi/viewcontent.cgi?article=1002&context=ijpbl>

Schwartz, K. (2018). “How Helping Students to Ask Better Questions Can Transform Classrooms.” Retrieved 20 April 2020 from <https://www.kqed.org/mindshift/51186/how-helping-students-to-ask-better-questions-can-transform-classrooms>

Science and Education Resource Center at Carleton College (SERC, 2018). “Teaching with Simulations.” Retrieved 20 May 2020 from

<https://serc.carleton.edu/sp/library/simulations/index.html>

Sigelman, M. (2017). *Skills, Not Jobs: Cracking the Genome of the Job Market*. September 2017, <http://staticweb.maine.edu/wp-content/uploads/2014/02/Workforce-Development-Presentation-Matt-Sigelman.pdf?0fa197>. PowerPoint Presentation.

Smith, A. (Performing in Education with April Smith, n.d.). “Driving Questions in Project-Based Learning.” [Blog post]. Retrieved 01 April 2020 from

<https://performingineducation.com/driving-questions/>

Smith, M.K. (2002). “Jerome S. Bruner and the process of education.” Retrieved 26 March 2020 from <http://infed.org/mobi/jerome-bruner-and-the-process-of-education/>

Spencer, J. (2018). “How Do You Teach to the Standards When Doing Project-Based Learning?” Retrieved 19 May 2020 from <http://www.spencerauthor.com/standards-and-pbl/>

StateUniversity.com (n.d.). “Learning Theory: Constructivist Approach.” Retrieved 27 March 2020 from <https://education.stateuniversity.com/pages/2174/Learning-Theory-CONSTRUCTIVIST-APPROACH.html>

Stobaugh, R. (2019). *50 Strategies to Boost Cognitive Engagement: Creating a Thinking Culture in the Classroom*. Bloomington, IN: Solution Tree Press.

TeachThought Staff (2017). “10 Benefits of Inquiry-Based Learning.” Retrieved 10 April 2020 from <https://www.teachthought.com/critical-thinking/10-benefits-of-inquiry-based-learning/>

Terada, Y. (2018). “Boosting Students Engagement Through Project-Based Learning.” Retrieved 18 May 2020 from <https://www.edutopia.org/article/boosting-student-engagement-through-project-based-learning>

Tompkins, G.E. (2017). *Literacy for the 21st Century: A Balanced Approach* (7th ed.). New York, NY: Pearson.

University of California Berkeley (n.d.). “Understanding Evolution: Case study – Why so many beetles?” Retrieved 12 May 2020 from https://evolution.berkeley.edu/evolibrary/article/side_0_0/beetles_01

University of North Texas (UNT Teaching Commons, 2020). “GRASPS: A Model for Meaningful Assessment.” Retrieved 15 April 2020 from <https://teachingcommons.unt.edu/teaching-essentials/course-design/grasps-model-meaningful-assessment>

U.S. Department of Education (n.d.). “Science, Technology, Engineering and Math: Education for Global Leadership.” Retrieved 18 May 2020 from <http://www.ed.gov/stem>

Van den Berg, Y., E. Segers, & A.H.N. Cillessen (2011). “Changing Peer Perceptions and Victimization through Classroom Arrangements: A Field Experiment.” In *Journal of Abnormal Psychology*, 40(3), pgs. 403-412. Available at: https://www.researchgate.net/publication/51632941_Changing_Peer_Perceptions_and_Victimization_through_Classroom_Arrangements_A_Field_Experiment

Wannarka, R. & K. Ruhl (2008). “Seating arrangements that promote positive academic and behavioural outcomes: a review of empirical research.” Retrieved 08 April 2020 from http://www.corelearn.com/files/Archer/Seating_Arrangements.pdf

Wabisabi Learning (August 2, 2016). “The Critical 21st Century Skills Every Student Needs and Why.” [Blog post]. Retrieved 10 April 2020 from <https://wabisabilearning.com/blogs/literacy-numeracy/skills-every-student-needs>

Zwiers, J. (2004). *Building reading comprehension habits in Grades 6-12*. Newark, DE: International Reading Association.