



## REL Pacific Ask A REL Response

Curriculum and Instruction  
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### Question:

**What are the best practices in project-based learning that support changes in behavior, especially the development of social, emotional, and behavioral competencies?**

### Response:

Following an established REL Pacific research protocol, we conducted a web-based search for resources related to project-based learning practices that are associated with positive changes in student social, emotional, and behavioral outcomes (see Methods section for search terms and resource selection criteria). We focused our search in particular on studies in the Pacific and other indigenous contexts for greater relevancy to the Pacific region, however we did include studies with more generalizable findings.

References are listed in alphabetical order, not necessarily in order of relevance. Descriptions of the resources are quoted directly from the publication abstracts. We have not evaluated the quality of references and the resources provided in this response. We offer them only for your reference. Also, our search included the most commonly used research resources, but they are not comprehensive and other relevant references and resources may exist.

### Research References

Bell, S. (2010). Project-based learning for the 21st century: Skills for the future. *The Clearing House*, 83(2), 39-43. Retrieved from <https://eric.ed.gov/?id=EJ872047>.

*From the abstract:* “Project-Based Learning (PBL) is an innovative approach to learning that teaches a multitude of strategies critical for success in the twenty-first century. Students drive their own learning through inquiry, as well as work collaboratively to research and create projects that reflect their knowledge. From gleaming new, viable technology skills, to becoming proficient communicators and advanced problem solvers, students benefit from this approach to instruction.”

English, M. C., & Kitsantas, A. (2013). Supporting student self-regulated learning in problem- and project-based learning. *Interdisciplinary Journal of Problem-Based Learning*, 7(2). Retrieved from <https://eric.ed.gov/?id=EJ1058698>.

*From the abstract:* “In order to be successful in problem- or project-based learning (PBL), students must take responsibility for the learning process by setting goals, monitoring, reflecting, and sustaining their motivation from the beginning of the project until the end. However, for many students, these processes do not occur naturally or easily. Therefore, the learning environment and teaching practices in PBL must be designed with intention to support students’ self-regulated learning (SRL). This paper describes specific learning environment features and teaching practices that have been shown to foster student responsibility for learning in each phase of PBL, with the purpose of providing educators with guidance for developing SRL in PBL, and ultimately, student motivation and ability to learn. To accomplish this, a theoretical model of the relationship between PBL and SRL is presented, along with research-driven guidelines on how to promote student responsibility for learning in PBL.”

Husin, W. N. F. W., Arsad, N. M., Othman, O., Halim, L., Rasul, M. S., Osman, K., & Iksan, Z. (2016). Fostering students' 21st century skills through Project Oriented Problem Based Learning (POPBL) in integrated STEM education program. *Asia-Pacific Forum on Science Learning and Teaching*, 17(1), 1-18. Retrieved from <https://eric.ed.gov/?id=EJ1113235>.

*From the abstract:* “Students nowadays need to be equipped with twenty first century skills in order to ensure their competitiveness in this era of globalization, especially in the science and technology sector. Therefore, this study aimed to identify the changes of 21st century skills among students after participating in an integrated Science, Technology, Engineering and Mathematics (STEM) education program. Project Oriented Problem Based Learning (POPBL) approach was applied in the learning activities of this program as its fundamental pedagogy. A total of 125 secondary school students of the age 13-14 namely from the rural areas were involved as respondents. This study employed one group quasi-experimental to identify the students’ 21st century skills before and after participating in the program. Data were analysed for descriptively, followed by an inferential analysis to compare the means (t-test) between the pre and post test. The findings from this study revealed that the level of 21st century skills (Digital age literacy, Inventive thinking, Effective communication and Spiritual values) among the students did increase and the increase was statistically significant. Interestingly, one of the components of the 21st century skills, namely ‘high productivity skills’ showed positive changes, from moderate to high level skills. The outcome of this study provides evidence that the application of POPBL in STEM education programs could help students to enhance their 21st century skills by learning how to solve real world problems based on authentic and real life experiences through project work.”

Kim, D., & Lim, C. (2018). Promoting socially shared metacognitive regulation in collaborative project-based learning: A framework for the design of structured guidance. *Teaching in Higher Education*, 23(2), 194-211. Retrieved from <https://eric.ed.gov/?id=EJ1167716>.

*From the abstract:* “Despite the emergence of collaborative project-based learning in higher education settings, how it can be supported has received little attention. We noted the positive impact of socially shared metacognitive regulation on students’ collaboration processes. The purpose of this study was to present a framework for the design and implementation of socially shared metacognitive regulation supports. We (a) proposed a framework for designing guidance for socially shared metacognitive regulation and (b) implemented the design as collaboration scripts. An empirical study was conducted to validate the framework by examining the effect of collaboration script on 32 students’ interactions in a real setting. Data included 2695 utterances resulting from participants’ team discussions. The results indicated that the collaboration scripts used to support socially shared metacognitive regulation positively influenced participants’ interactions regarding team planning and knowledge construction. The findings provide validation for the suggested framework. Implications for research and practice were also discussed.”

Lin, C. S., Ma, J. T., Kuo, K. Y. C., & Chou, C. T. C. (2015). Examining the efficacy of project-based learning on cultivating the 21st century skills among high school students in a global context. *Journal on School Educational Technology*, 11(1), 1-9. Retrieved from <https://eric.ed.gov/?id=EJ1097421>.

*From the abstract:* “The goal of the study is to explore the opportunities and challenges associated with Project Based Learning strategy in a global context on the aspects of both fostering learning community of practices and nurturing the 21 century skills. For collecting empirical data, the study implements and administers an online international project-based learning program for high school students. Since it is claimed that interpersonal interaction is key to the success of online project-based learning programs, the study first focuses on investigating patterns of community of practice, which is a combination of online learning behaviors and interpersonal interaction, among students against a claimed theoretical framework. For unveiling the impacts on fertilizing the 21 century skills, the study examines the perceptions of students and teachers participating in the online international project-based learning program. Results of the study confirm the asserted theoretical framework regarding the community of practices and reveal that students of various countries perform differently in terms of community of practices in virtual learning space. As to building the 21 century skills on students, the study credits the project-based learning strategy deploying in a global context for providing intuitive and essential aspects of learning ingredients to students for pursuing skills related to Communication, Collaboration, Complex Problem-solving, Critical Thinking, and Creativity.”

Lin, C. T., & Chuang, S. S. (2019). Using team projects for making short films to cultivate students’ interdisciplinary competencies. *Interactive Learning Environments*, 27(1), 103-117. Retrieved from <https://eric.ed.gov/?id=EJ1199441>.

*From the abstract:* “Currently, education places a focus on teamwork, with empathy playing an important role in the coherence of teammates embark on project based learning (PBL). It is often difficult to persuade students to reach an agreement when they are working in groups. Enhancing empathy may reduce arguments and conflict during

teamwork Creating interactive learning environments (ILEs) has been recognized as a major approach to improving students' ability to express the empathy necessary to enhance teamwork and acquire heterogeneous competencies. In this study, Taiwanese junior high school students were placed into teams to brainstorm and devise innovative ideas and complete team projects. Students were instructed to shoot a film on bullying. The project was intended to improve their abilities in perspective taking, affective response, emotional regulation, self/other awareness, empathy, and competence. Study results suggest that peer learning incorporating PBL and ILE can significantly increase students' empathy and functional competence acquisition. Results also show empathy is a key mediator between peer learning and competence acquisition.”

Stefanou, C., Stolk, J. D., Prince, M., Chen, J. C., & Lord, S. M. (2013). Self-regulation and autonomy in problem- and project-based learning environments. *Active Learning in Higher Education*, 14(2), 109-122. Retrieved from <https://eric.ed.gov/?id=EJ1014899>.

*From the abstract:* “Investigations of the relationships between contexts in which learning occurs and students’ behaviours, cognitions and motivations may further our understanding of how instruction is related to students’ development as self-regulated learners. In this study, student self-regulated learning strategies in problem-based learning and project-based learning environments were examined to determine whether student self-regulation outcomes differed depending on the instructional design. Quantitative results showed that student motivations and behaviours were not statistically different in the two settings. Differences in cognitions associated with self-regulated learning were, however, observed in the two settings, with students in the project-based environments reporting higher levels of elaboration, critical thinking and metacognition. In addition, students in the project-based courses reported higher perceived autonomy support, or the degree to which they perceived their instructors provided them with supportive opportunities to act and think independently compared to students in the problem-based courses. These findings indicate that different non-traditional student-centred learning environments may support different outcomes related to self-regulated learning.”

Yoder, N. (2014). Teaching the whole child: Instructional practices that support social-emotional learning in three teacher evaluation frameworks. Center on Great Teachers and Leaders Research-to-Practice Brief. Washington, DC: Center on Great Teachers and Leaders. Retrieved from <https://eric.ed.gov/?id=ED581718>.

*From the abstract:* “Teachers help promote the social and emotional learning skills students need to be college and career ready, such as collaborating with others, monitoring their own behavior, and making responsible decisions. Social-emotional learning (SEL) is critical to the introduction of college and career readiness standards. To bridge the connection between social-emotional learning and the work that educators are already doing, educators need access to tools, supports, and resources on social-emotional learning that are integrated into existing teacher evaluation and professional development systems. Not only does this reinforce the importance of social-emotional learning, it avoids overburdening educators by layering on yet another separate initiative. Ensuring

that the teacher evaluation systems privilege and reinforce the successful teaching of these competencies is, therefore, of critical importance. To aid this critical work, this Research-to-Practice Brief aims to do the following: (1) Identify the teaching practices that promote student social-emotional learning, which in turn are critical for student academic learning; and (2) Showcase how three popular professional teaching frameworks (the Danielson "Framework for Teaching," the Classroom Assessment Scoring System observation instrument, and the Marzano observation protocol) embed practices that influence not only student academic learning but also student social and emotional competencies. Although this Research-to-Practice Brief discusses one approach to connect social-emotional learning to other initiatives (connecting general teaching practices that promote SEL to current professional teaching frameworks), there are multiple ways to integrate SEL. Action steps to help states better support educators as they teach the whole child are provided.”

## **Methods**

### **Keywords and Search Strings**

The following keywords and search strings were used to search the reference databases and other sources:

“Project-based learning” not "dissertations & theses”

“Project-based learning” and “pacific” not “dissertations & theses”

“Project-based learning” and “behavior” not “dissertations & theses”

“Project-based learning” and “SEL” not “dissertations & theses”

“Project-based learning” and “social-emotional learning” not “dissertations & theses”

“Project-based learning” and “self-awareness” not “dissertations & theses”

“Project-based learning” and “self-management” not “dissertations & theses”

“Project-based learning” and “responsible decision-making” not “dissertations & theses”

“Project-based learning” and “decision-making” not “dissertations & theses”

“Project-based learning” and “metacognition” not “dissertations & theses”

“Project-based learning” and “relationship skills” not “dissertations & theses”

“Project-based learning” and “teamwork” not “dissertations & theses”

“Project-based learning” and “social awareness” not “dissertations & theses”

## **Databases and Resources**

We searched ERIC, a free online library of over 1.6 million citations of education research sponsored by the Institute of Education Sciences, for relevant resources. Additionally, we searched the academic database Google Scholar, and ProQuest.

## **Reference Search and Selection Criteria**

REL Pacific searched ERIC and other academic journal databases for studies that were published in English-language peer-reviewed research journals within the last 20 years. REL Pacific prioritized documents that are accessible online and publicly available, and prioritized references that provide practical information based on peer-reviewed research for this Ask A REL requestor. Methodological priorities and considerations were given to randomized control trials where possible, followed by meta-analyses, literature reviews, and quasi-experiments. The target population (e.g., school-level, sample size) was also a consideration. As always, REL Pacific first considers studies conducted in the Pacific region or similar contexts, but also includes research with generalizable findings.

This memorandum is one in a series of quick-turnaround responses to specific questions posed by educational stakeholders in the Pacific Region (American Samoa, the Commonwealth of the Northern Mariana Islands, the Federated States of Micronesia, Guam, Hawai'i, the Republic of the Marshall Islands, and the Republic of Palau), which is served by the Regional Educational Laboratory (REL Pacific) at McREL International. This memorandum was prepared by REL Pacific under a contract with the U.S. Department of Education's Institute of Education Sciences (IES), Contract ED-IES-17-C-0010, administered by McREL International. Its content does not necessarily reflect the views or policies of IES or the U.S. Department of Education, nor does mention of trade names, commercial products, or organizations imply endorsement by the U.S. Government.