

# Pathways to Impact for SchoolsPLP

LOGIC MODEL AND COMPILATION OF SUPPORTING RESEARCH AND LITERATURE

*June 2023*

## SUMMARY

This document identifies existing research and literature that supports a series of theory of action statements aligned to SchoolsPLP's logic model.



## Conclusion

### SCHOOLSPLP MEETS THE EVERY STUDENT SUCCEEDS ACT (ESSA) TIER 4 EVIDENCE RATING

The [ESSA tiers of evidence](#) are validity standards set by the U.S. Department of Education. When we helped develop the [research guidelines](#) for the Software & Information Industry Association, we took a close look at ESSA and how it is often interpreted. Each of the four ESSA evidence tiers has a set of requirements that a program or product must meet.

The Tier 4 ESSA rating expects a program or product to demonstrate a rationale. To do this, three standards must be met.

1. A well-defined logic model
2. A strong research base underpinning the logic model
3. A current effort or plan to study the effect of the program or product on important outcomes

This Pathways to Impact report shows how SchoolsPLP meets these three standards.

#### Standard 1. A Well-Defined Logic Model

Empirical Education and SchoolsPLP worked together to develop a well-defined logic model (Figure 1). The logic model identifies the inputs, activities, outputs, outcomes, and external factors associated with the implementation of SchoolsPLP. Reviewing the logic model will convey how SchoolsPLP intends to produce the desired outcomes.

#### Standard 2. A Strong Research Base

Empirical Education and SchoolsPLP worked together to develop three theory of action (TOA) statements that support the main components of the logic model. Once defined, we compiled existing research that supports each TOA statement. See page 4 for the annotated bibliography.

#### Standard 3. A Plan to Study Program Effects

SchoolsPLP is discussing options to design and implement an efficacy study of their program. The study will inform SchoolsPLP who the product works best for and will provide feedback for continuous improvement.





*Our Goal is to provide teachers, administrators, parents, and students with access to a streamlined and consolidated online learning platform that is highly customizable and optimized to provide differentiated instruction.*

## Access

**1.** SchoolsPLP platform and content.

**2.** Training and ongoing support resources.

**3.** SchoolsPLP expert staff.

ACTIVITIES	 <p><b>Teacher Implementation</b></p> <ul style="list-style-type: none"> <li>Professional development, training and ongoing support</li> <li>Add courses, customize student learning plans, and monitor student progress</li> </ul>	 <p><b>Student-led Learning</b></p> <ul style="list-style-type: none"> <li>Engage in assigned coursework</li> <li>Self-monitor progress</li> <li>Complete assessments and courses</li> </ul>	 <p><b>Parent Access</b></p> <ul style="list-style-type: none"> <li>View student coursework and materials</li> <li>Regular reports and communication</li> <li>Real-time monitoring, feedback, and support</li> </ul>	 <p><b>Administrator Access</b></p> <ul style="list-style-type: none"> <li>Ongoing training and support</li> <li>Manage school level access</li> <li>Communicate with teachers and families</li> </ul>
RESULTS	<p>Improved efficiencies and improved ability to provide targeted feedback to students</p>	<p>Increased motivation, engagement, self efficacy and belonging, leading to increased academic success</p>	<p>Quick and easy communication and knowing what your student is learning in real-time</p>	<p>Real-time data at your fingertips to better understand school progress</p>

**The SchoolsPLP logic model is built on research** that demonstrates positive effects from use of technology tools at the classroom level, use of formative and summative data by teachers to customize learning, and family engagement in student learning.

**SchoolsPLP is working with an external research firm** to design and implement an efficacy study of the program. The study will inform who the product works best as well as feedback for continuous improvement.

## Introduction

SchoolsPLP, in collaboration with Empirical Education, developed a well-defined logic model. We simultaneously identified theories of action based on the key components in the logic model. Theories of action are statements that are supported by research and articulate how implementation strategies can lead to improved practices in teaching and learning. The findings from existing research and literature in the field substantiate the Theory of Action statements that highlight specific changes shown in SchoolsPLP's logic model.

This report includes research supporting the following Theory of Action statements.

1. When school and district administrators invest in, prioritize, and support the use of high-quality, customizable digital learning resources used by teachers and students, engagement and achievement increase.
2. When teachers have access to timely formative data and high-quality digital learning resources, they are able to better understand the unique needs of their students and differentiate content and instructional design to meet their learners where they are academically.
3. When parents are given access to detailed and timely feedback on their child's assignments, parents are more engaged in their child's learning and better able to support their child's academic struggles and successes.

*Theory of Action Statement 1: When school and district administrators invest in, prioritize, and support the use of high-quality, customizable digital learning resources used by teachers and students, engagement and achievement increase.*

### SEARCH SUMMARY

We searched for relevant resources including research reports, descriptive studies, and literature reviews on the relationship between school and district leadership support and the use of instructional technology. We searched using the following descriptors and terms.

- “administrator attitudes” AND “technology integration”

For additional information on the search methodology, please see the Methodology section at the end of this document.

### RESEARCH REFERENCES

#### 1. Best Practices of Leadership In Educational Technology

Brown, L. (2014). Best practices of leadership in educational technology. *Journal of Educational Technology*, 11(1), 1-6.

<https://files.eric.ed.gov/fulltext/EJ1098558.pdf>

*From The Abstract*

“Leadership in Educational Technology is a relatively new field that is changing as fast as technology itself. Success for an educational leader includes maintaining a firm grasp of how to diagnose the needs of a district, a school, or a classroom while aligning policies, procedures, and protocols into a format that will empower the individual teacher efficacy and student learning outcomes. Being a leader in educational technology includes more than incorporating new technologies into the classroom. Leadership in educational technology requires an outlook that views technology not as a tool for every occasion, but as a tool that when used, will enhance the learning process. An approach of best practices is essential to maintain effectiveness as an educational leader, and yet there is very

little research that includes a synthesis of the best practices or approaches that are certain to increase an educational leader's effectiveness. A best practices approach that relies on the use of constructivist teaching method, that strives for continuous improvement through the use of professional learning networks and communities, and that utilizes online professional development will produce the kind of effectiveness in teachers that is associated with positive student learning outcomes."

## 2. Beyond the Classroom: A Framework for Growing School Capacity in a Digital Age

Haynes, C. A., & Shelton, K. (2018). Beyond the classroom: A framework for growing school capacity in a digital age. *Journal of Research on Technology in Education*, 50(4), 271-281. <https://doi.org/10.1080/15391523.2018.1451791>

*From the Abstract*

"Rapid technological advancements promise unprecedented educational opportunities to foster student-centered and personalized learning, yet many schools are underprepared, lacking comprehensive organizational strategies for technology enhanced learning. This study sought to provide a framework to guide K-12 school leaders to build and evaluate digital-age school capacity by identifying essential criteria for digital learning in schools, resulting in the development of the Digital Learning Implementation Framework for Education (D-LIFE). Geographically dispersed digital learning experts contributed to a six-round Delphi study gaining consensus on 148 essential criteria for school administrators and policymakers to appraise strategic evaluation of technology implementation. When compared to prominent frameworks, D-LIFE confirmed high-level alignment with ISTE Essential Conditions, providing a comprehensive evaluation framework for K-12 schooling not addressed in prominent standards or frameworks."

## 3. Leading Technology-rich School Districts: Advice from Tech-savvy Superintendents

McLeod, S., Richardson, J. W., & Sauer, N. J. (2015). Leading technology-rich school districts: Advice from tech-savvy superintendents. *Journal of Research on Leadership Education*, 10(2), 104-126. <https://journals.sagepub.com/doi/10.1177/1942775115584013>

*From the Background*

"Superintendents' instructional leadership is critical to the academic success of school systems. In addition to traditional work complexities, today's superintendents must navigate rapid and significant technological transformations. In this study, an exploratory sample of "technology-savvy" superintendents was interviewed to ascertain advice about how to navigate the complexities that surround successful district-level technology leadership strategies and mind-sets. Participants highlighted issues such as budgets, professional development, and instructional leadership, and affirmed the value of personally modeling technology use. They also emphasized both personal and organizational risk-taking and shared how communities of practice can help alleviate skill and knowledge gaps."

## 4. Leadership Practice in a One-to-one Computing Initiative: Principals' Experiences in a Technology Driven, Second-order Change

Pautz, S., & Sadera, W. A. (2017). Leadership practice in a one-to-one computing initiative: Principals' experiences in a technology driven, second-order change. *Computers in the Schools*, 34(1-2), 45-59. <https://doi.org/10.1080/07380569.2017.1296314>

*From the Abstract*

“School districts have been placed under increasing pressure to equalize student access to technology and equip students with the skills necessary to be competitive in a global economy. In response, a growing number of schools have sought an irreversible and dramatic departure from past practices, a second-order change, to learner-centered environments powered by one-to-one computing. While one-to-one computing has drawn the attention of researchers for more than 30 years, the field has not examined principals' experiences in leading the implementation of such an initiative. Yet leadership research continually affirms the importance of the principal in effective change implementation. This article discusses the findings of a study that explored principals' experiences leading the changes associated with a one-to-one initiative and the contexts or situations that influenced those experiences. Using a phenomenological method, this study explored how eight elementary school principals leading a one-to-one initiative viewed their role and responsibilities, promoted change, and responded to successes and challenges. This study provides new insights into change leadership that will inform practice in the leadership of one-to-one computing initiatives.”

## 5. District Technology Leadership Then and Now: A Comparative Study of District Technology Leadership from 2001 to 2014

Richardson, J. W., & Sterrett, W. L. (2018). District technology leadership then and now: A comparative study of district technology leadership from 2001 to 2014. *Educational Administration Quarterly*, 54(4), 589-616.

<https://journals.sagepub.com/doi/abs/10.1177/0013161X18769046>

*From the Abstract*

“This article focuses on district superintendents who were recognized as *eSchoolNews Tech-Savvy Superintendents*. **Research Methods:** Using interviews, this study compares data from superintendents who won this award between 2001 and 2010 in contrast to those who won the award between 2011 and 2014. The focus of the study is on understanding how discussions of challenges and successes within this population have shifted over nearly 15 years. **Findings:** A key finding is that these district-level leaders have shifted away from first-order changes of implementing technology initiatives and toward second-order changes of supporting teaching and learning that is supported with modern digital technologies. **Implications:** Recommendations are made for leadership preparation as well as lines of inquiry.”

## 6. The Principal's Role in Supporting a School's Technology Culture: A Mixed Methods Study

Sawicki, J. H. (2021). *The principal's role in supporting a school's technology culture: A mixed methods study* (Publication No. 28648377) [Doctoral dissertation, Delaware Valley University]. ProQuest.

<https://www.proquest.com/openview/ba441ffe0c56e0154aeb4ed8f9ea33a1/1?pq-origsite=gscholar&cbl=18750&diss=y>

*From the Background*

“This mixed methods exploratory sequential study investigated the principal's role in supporting a school's technology culture. In light of the 2019-2020 worldwide pandemic, schools around the world saw a significant increase put on technology tools to facilitate instruction virtually. As building leaders, the administrators led the transition to fully virtual instruction by supporting their teachers. The researcher collected data from K-12 principals and assistant principals in a targeted six county area of eastern Pennsylvania. This study used a survey

along with semi-structured interviews. The pandemic closure of 2019-2020 provided a unique opportunity to understand principals' knowledge of the ISTE-EL Standards, to identify how they demonstrate implementation of the ISTE-EL Standards, to see if they value technology as curriculum tool, and to see how prepared building leaders were for the sudden shift to fully virtual instruction.

Overall, this study revealed that administrators have knowledge of the ISTE-EL standards as measured by their responses to 45 questions on the survey. Two themes emerged from the interview data that highlighted elements of the principals' implementation of the ISTE-EL Standards: access to the internet and professional development and collaboration. Interview data revealed that these administrators, as a whole, value technology as a curriculum tool. In schools where one-to-one programs were already in place, their perception was that they were prepared to make the shift to fully virtual instruction."

## 7. An Analysis of Factors which Influence High School Administrators' Readiness and Confidence to Provide Digital Instructional Leadership

Shepherd, A. C., & Taylor, R. T. (2019). An analysis of factors which influence high school administrators' readiness and confidence to provide digital instructional leadership. *International Journal of Educational Leadership Preparation*, 14(1), 52-76.

<https://eric.ed.gov/?id=EJ1218848>

*From the Abstract*

"School leaders are to be instructional leaders within a digital environment, just as they are expected to do in the non-digital environment. The purpose of this study was to analyze the factors which high school administrators perceive to influence their knowledge and confidence to lead in a digital school environment. Findings suggest that administrators should seek professional development opportunities, knowledgeable and confident colleagues, and opportunities to supervise others to increase knowledge and confidence."

## 8. Reimagining the Role of Technology in Education: 2017 National Education Technology Plan Update

U.S. Department of Education. (2017). *Reimagining the Role of Technology in Education: 2017 National Education Technology Plan Update*. <https://lincs.ed.gov/professional-development/resource-collections/profile-902>

*From the Abstract*

"The National Education Technology Plan (NETP) sets a national vision and plan for learning enabled by technology through building on the work of leading education researchers; district, school, and higher education leaders; classroom teachers; developers; entrepreneurs; and nonprofit organizations. The principles and examples provided in this document align to the Activities to Support the Effective Use of Technology (Title IV) Part A of the Elementary and Secondary Education Act (ESEA), as amended by the Every Student Succeeds Act (ESSA). To illustrate key ideas and recommendations, the plan includes examples of the transformation enabled by the effective use of technology. These examples include both those backed by rigorous evidence as well as emerging innovations. The identification of specific programs or products in these examples is designed to provide a clearer understanding of innovative ideas. The NETP also provides actionable recommendations to implement technology and conduct research and development successfully that can advance the effective use of technology to support learning and teaching. This 2017 update to the NETP is the first yearly update in the history of the plan."

*Theory of Action Statement 2: When teachers have access to timely formative data and high-quality digital learning resources, they are able to better understand the unique needs of their students and differentiate content and instructional design to meet their learners where they are academically.*

## SEARCH SUMMARY

We searched for relevant resources including research reports, descriptive studies, and literature reviews on the relationship between formative assessment, differentiated instruction, and student outcomes. We searched using the following descriptors and terms.

- “Mid-cycle formative assessments”
- “Student centered learning” AND Differentiated”
- “Individualized instruction”
- “Student evaluation”

For additional information on the search methodology, please see the Methodology section at the end of this document.

## RESEARCH REFERENCES

### **1. Twenty-first century adaptive teaching and individualized learning operationalized as specific blends of student-centered instructional events: A systematic review and meta-analysis**

Bernard, R. M., Borokhovski, E., Schmid, R. F., Waddington, D. I., & Pickup, D. I. (2019). Twenty-first century adaptive teaching and individualized learning operationalized as specific blends of student-centered instructional events: A systematic review and meta-analysis. *Campbell Systematic Reviews*, 15(1-2), 1-35. <https://onlinelibrary.wiley.com/doi/10.1002/cl2.1017>

*From The Abstract*

“Teaching methods that individualize and adapt instructional conditions to K-12 learners' needs, abilities, and interests help improve learning achievement. The most important variables are the teacher's role in the classroom as a guide and mentor and the adaptability of learning activities and materials. This Campbell systematic review assesses the overall impact on student achievement of processes and methods that are more student-centered versus less student-centered. It also considers the strength of student-centered practices in four teaching domains: (1) Flexibility: Degree to which students can contribute to course design, selecting study materials, and stating learning objectives; (2) Pacing of instruction: Students can decide how fast to progress through course content and whether this progression is linear or iterative; (3) Teacher's role: Ranging from authority figure and sole source of information, to teacher as equal partner in the learning process; and (4) Adaptability: Degrees of manipulating learning environments, materials, and activities to make them more student-centered. This review presents evidence from 299 studies (covering 43,175 students in a formal school setting) yielding 365 estimates of the impact of teaching practices. The studies spanned the period 2000-2017 and were mostly carried out in the United States, Europe, and Australia. This review confirms previous research on the effectiveness of student-centered and active learning. It goes further in suggesting the teacher's role promotes effective student-centered learning, and excessive student control over pacing appears to inhibit it.”



## 2. Differentiated Instruction in a Data-based Decision-making Context

Faber, J. M., Glas, C. A., & Visscher, A. J. (2018). Differentiated instruction in a data-based decision-making context. *School Effectiveness and School Improvement*, 29(1), 43-63. <https://doi.org/10.1080/09243453.2017.1366342>

*From the Abstract*

“In this study, the relationship between differentiated instruction, as an element of data-based decision making, and student achievement was examined. Classroom observations (n = 144) were used to measure teachers' differentiated instruction practices and to predict the mathematical achievement of 2nd- and 5th-grade students (n = 953). The analysis of classroom observation data was based on a combination of generalizability theory and item response theory, and student achievement effects were determined by means of multilevel analysis. No significant positive effects were found for differentiated instruction practices. Furthermore, findings showed that students in low-ability groups profited less from differentiated instruction than students in average or high-ability groups. Nevertheless, the findings, data collection, and data-analysis procedures of this study contribute to the study of classroom observation and the measurement of differentiated instruction.”

## 3. The effectiveness and features of formative assessment in US K-12 education: A systematic review

Lee, H., Chung, H. Q., Zhang, Y., Abedi, J., & Warschauer, M. (2020). The effectiveness and features of formative assessment in US K-12 education: A systematic review. *Applied Measurement in Education*, 33(2), 124-140.

<https://www.tandfonline.com/doi/abs/10.1080/08957347.2020.1732383>

*From The Abstract*

“In the present article, we present a systematical review of previous empirical studies that conducted formative assessment interventions to improve student learning. Previous meta-analysis research on the overall effects of formative assessment on student learning has been conclusive, but little has been studied on important features of formative assessment interventions and their differential impacts on student learning in the United States' K-12 education system. Analysis of the identified 126 effect sizes from the selected 33 studies representing 25 research projects that met the inclusion criteria (e.g., included a control condition) revealed an overall small-sized positive effect of formative assessment on student learning ( $d = .29$ ) with benefits for mathematics ( $d = .34$ ), literacy ( $d = .33$ ), and arts ( $d = .29$ ). Further investigation with meta-regression analyses indicated that supporting student-initiated self-assessment ( $d = .61$ ) and providing formal formative assessment evidence (e.g., written feedback on quizzes;  $d = .40$ ) via a medium-cycle length (within or between instructional units;  $d = .52$ ) were found to enhance the effectiveness of formative assessments.”

## 4. Formative assessment and elementary school student academic achievement: A review of the evidence

Klute, M., Apthorp, H., Harlacher, J., & Reale, M. (2017). *Formative Assessment and Elementary School Student Academic Achievement: A Review of the Evidence* (REL 2017-259). Regional Educational Laboratory Central. <https://eric.ed.gov/?id=ED572929>

*From The Abstract*

“Formative assessment is a process that engages teachers and students in gathering, interpreting, and using evidence about what and how students are learning in order to facilitate further student learning during a short period of time. The process offers the potential to guide educator decisions about midstream adjustments to instruction that address learner needs in a timely manner. Formative assessment can be implemented in classrooms

in various ways. For example, formative assessment can be quick and informal, such as giving students "I learned..." prompts to reflect on and discuss their progress toward lesson objectives. Formative assessment can also be more formal and involve multiple components, such as curriculum-based measurement, to frequently track and analyze individual student learning for the purpose of modifying instruction as warranted (Black & Wiliam, 1998a). Members of Regional Educational Laboratory (REL) Central's Formative Assessment Research Alliance, including principals and district administrators, indicated that teachers in the region vary widely in their understanding of formative assessment and how to use it. They wished to focus professional development efforts on formative assessment practices that have evidence of effectiveness for promoting student learning. To address this need, this review identifies studies that examine the effectiveness of formative assessment and provides an overall average estimate of its effectiveness. Alliance members also expressed concern that teachers have difficulty finding time to use formative assessment. One approach to minimizing the formative assessment burden on teachers is to involve students more actively in the process (Black & Wiliam, 1998a). This review also compares the effectiveness of different types of formative assessment, including those directed by students and those directed by other agents, such as educators and computer software programs. The review team conducted a comprehensive search to locate research on formative assessment interventions. After screening studies for relevance, researchers certified in the U.S. Department of Education's What Works Clearinghouse (WWC) standards and procedures coded and rated each of 76 relevant studies using systematic, rigorous, scientific evidence standards modeled after the WWC study review process and standards (U.S. Department of Education, 2014b). The review team identified 23 studies that it determined had been conducted rigorously enough to have confidence that the formative assessment interventions caused the observed effects on student outcomes. Twenty-two of the studies compared academic outcomes for students participating in formative assessment with academic outcomes for students who did not participate in formative assessment. Nineteen of the 22 studies provided enough information to calculate an effect size, which describes the magnitude of the effect of the intervention. When examining the results across these 19 studies, the review team concluded that: (1) Overall, formative assessment had a positive effect on student academic achievement. On average across all the studies, students who participated in formative assessment performed better on measures of academic achievement than those who did not; (2) Formative assessment used during math instruction had larger effects, on average, than did formative assessment used during reading and writing instruction; (3) Across all subject areas (math, reading, and writing), formative assessment had larger effects on student academic achievement when other agents, such as a teacher or a computer program, directed the formative assessment; (4) For math, both student-directed formative assessment and formative assessment directed by other agents were effective; (5) For reading, other-directed formative assessment was more effective than student-directed formative assessment; and (6) For writing, the effect of other-directed formative assessment on student academic achievement was small, and not enough evidence was available to determine the effectiveness of student-directed formative assessment."

## 5. Formative assessment techniques to support student motivation and achievement.

Cauley, K. M., & McMillan, J. H. (2010). Formative assessment techniques to support student motivation and achievement. *The Clearing House: A Journal of Educational Strategies, Issues and Ideas*, 83(1), 1-6.

<https://www.tandfonline.com/doi/full/10.1080/00098650903267784>.

*From The Abstract*

"Formative assessment can have a powerful impact on student motivation and achievement. This article discusses five key practices that teachers can use to gather important information about student understanding, provide

feedback to students, and enable students to set and attain meaningful learning goals. Each of the techniques can enhance student motivation as well as achievement.”

*From The Conclusion*

“Formative assessment and, in particular, feedback and instructional correctives, can be a powerful technique to support student motivation and achievement. As teachers incorporate more formative assessment techniques into their day-to-day instruction, they will have information which they can use to modify their instruction. Teachers can also use this information about student understanding to help students self-assess and improve their own performance. When students focus on improvement and progress, they are more likely to adopt mastery goals and develop high self-efficacy and expectations for success. When students and teachers attribute student successes to effort, this attributions supports future successes. Formative assessment’s emphasis on instructional modifications and student improvement supports student motivation and enables them to maintain high engagement and achievement. Using formative assessments effectively is indeed key to student motivation and achievement.”

## 6. Optimizing the Efficacy of Learning Objectives through Pretests

Sana, F., Forrin, N. D., Sharma, M., Dubljevic, T., Ho, P., Jalil, E., & Kim, J. A. (2020). Optimizing the Efficacy of Learning Objectives through Pretests. *CBE - Life Sciences Education*, 19(3). <https://doi.org/10.1187/cbe.19-11-0257>

*From The Abstract*

“Learning objectives (LOs) are statements that typically precede a study session and describe the knowledge students should obtain by the end of the session. Despite their widespread use, limited research has investigated the effect of LOs on learning. In three laboratory experiments, we examined the extent to which LOs improve retention of information. Participants in each experiment read five passages on a neuroscience topic and took a final test that measured how well they retained the information. Presenting LOs before each corresponding passage increased performance on the final test compared with not presenting LOs (experiment 1). Actively presenting LOs increased their pedagogical value: Performance on the final test was highest when participants answered multiple-choice pretest questions compared with when they read traditional LO statements or statements that included target facts (experiment 2). Interestingly, when feedback was provided on pretest responses, performance on the final test decreased, regardless of whether the pretest format was multiple choice or short answer (experiment 3). Together, these findings suggest that, compared with the passive presentation of LO statements, pretesting (especially without feedback) is a more active method that optimizes learning.”

## 7. Embedded Formative Assessment

William, D. (2017). *Embedded Formative Assessment (Second Edition)*. Solution Tree. <https://eric.ed.gov/?id=ED591904>

*From The Description*

“By integrating classroom formative assessment practices into daily activities, educators can substantially increase student engagement and the rate of student learning. The second edition of this best-selling book by Dylan Wiliam presents new research, insights, and formative assessment strategies and techniques teachers can immediately apply in their classrooms. Updated examples and templates are included to help teachers elicit evidence of learning, provide meaningful feedback, and empower students to take ownership of their education. Implement effective assessment strategies in the classroom by: (1) Reviewing the five key strategies of formative assessment in the

classroom; (2) Learning more than 70 practical techniques for classroom formative assessment; (3) Examining research that states classroom formative assessment is the most impactful and cost-effective approach to raising student academic achievement; (4) Exploring the use of classroom questioning, learning intentions and success criteria, feedback, collaborative and cooperative learning, and self-regulated learning to engineer effective learning environments; and (5) Discovering new insights into the current states of education and employment, and a discussion of how these changes affect student performance and teacher practice.”

## **8. Twenty-first century adaptive teaching and individualized learning operationalized as specific blends of student-centered instructional events: A systematic review and meta-analysis**

Bernard, R. M., Borokhovski, E., Schmid, R. F., Waddington, D. I., & Pickup, D. I. (2019). Twenty-first century adaptive teaching and individualized learning operationalized as specific blends of student-centered instructional events: A systematic review and meta-analysis. *Campbell Systematic Reviews*, 15(1-2), 1-35. <https://onlinelibrary.wiley.com/doi/10.1002/cl2.1017>

*From The Abstract*

“Teaching methods that individualize and adapt instructional conditions to K-12 learners' needs, abilities, and interests help improve learning achievement. The most important variables are the teacher's role in the classroom as a guide and mentor and the adaptability of learning activities and materials. This Campbell systematic review assesses the overall impact on student achievement of processes and methods that are more student-centered versus less student-centered. It also considers the strength of student-centered practices in four teaching domains: (1) Flexibility: Degree to which students can contribute to course design, selecting study materials, and stating learning objectives; (2) Pacing of instruction: Students can decide how fast to progress through course content and whether this progression is linear or iterative; (3) Teacher's role: Ranging from authority figure and sole source of information, to teacher as equal partner in the learning process; and (4) Adaptability: Degrees of manipulating learning environments, materials, and activities to make them more student-centered. This review presents evidence from 299 studies (covering 43,175 students in a formal school setting) yielding 365 estimates of the impact of teaching practices. The studies spanned the period 2000-2017 and were mostly carried out in the United States, Europe, and Australia. This review confirms previous research on the effectiveness of student-centered and active learning. It goes further in suggesting the teacher's role promotes effective student-centered learning, and excessive student control over pacing appears to inhibit it.”

*Theory of Action Statement 3: When parents are given access to detailed and timely feedback on their child's assignments, parents are more engaged in their child's learning and better able to support their child's academic struggles and successes.*

## SEARCH SUMMARY

We searched for relevant resources including research reports, descriptive studies, and literature reviews on the relationship between parent engagement and student outcomes. We searched using the following descriptors and terms.

- "Parent engagement" AND "Student achievement"
- "Parent engagement" AND "Online learning"
- "Parent engagement" AND "Blended learning"
- "Parent engagement" AND "Formative feedback"

For additional information on the search methodology, please see the Methodology section at the end of this document.

## RESEARCH REFERENCES

### 1. Handbook of research on K-12 online and blended learning (2<sup>nd</sup> edition)

Kennedy, K., & Ferdig, R. E., (Eds.) (2018). *Handbook of Research on K-12 Online and Blended Learning (2nd edition)*.

Carnegie Mellon University Press. Retrieved from

[https://kilthub.cmu.edu/articles/journal\\_contribution/Handbook\\_of\\_Research\\_on\\_K-12\\_Online\\_and\\_Blended\\_Learning\\_Second\\_Edition\\_/6686813](https://kilthub.cmu.edu/articles/journal_contribution/Handbook_of_Research_on_K-12_Online_and_Blended_Learning_Second_Edition_/6686813)

#### *The Description*

"The Handbook of Research on K-12 Online and Blended Learning is an edited collection of chapters that sets out to present the current state of research in K-12 online and blended learning. The chapters describe where we have been, what we currently know, and where we hope to go with research in multiple areas."

#### *From Chapter 30: Parental involvement in K-12 Online and Blended Learning*

"The implications arising from the research presented in this chapter suggest that policy should be developed to help encourage and improve parental involvement, when their children are enrolled in K-12 online schooling, in ways that promote student academic success. Additionally, policy should ind ways to support efforts to educate parents on the depth of commitment that is required to help their children succeed in these alternative schools.

Policy concerning parental involvement in K-12 online learning should focus on issues that would enrich student academic achievement, increase high school graduation rates, and prepare students for college and their careers. For instance, policymakers, school administrators, teachers, and parents need to support policies which would: (a) provide efective training and support for parents as educational facilitators for their own students, especially concerning instructional support for students; (b) encourage efective parental involvement to support, guide, and motivate their own students; and (c) articulate and communicate guidelines concerning parental roles and responsibilities. Franklin, et al. (2015) issued an urgent call for research focused on students with disabilities which could help policy planning and decision making to support these students."

## 2. Parental educational expectations and academic achievement in children and adolescents: A meta-analysis

Pinquart, M., & Ebeling, M. (2020). Parental educational expectations and academic achievement in children and adolescents: A meta-analysis. *Educational Psychological Review*, 32, 463-480. <https://doi.org/10.1007/s10648-019-09506-z>

*From The Abstract*

“The present meta-analysis assessed concurrent and longitudinal associations between parental educational expectations and child achievement, and factors that mediate the effect of expectations on achievement. A systematic search in electronic databases identified 169 studies that were included in a random-effects meta-analysis. We found small to moderate bivariate cross-sectional ( $r = .30$ ) and longitudinal associations ( $r = .28$ ) between parental expectation and achievement which persisted after statistically controlling for socioeconomic status. Associations varied, in part, by children’s age, socioeconomic status, ethnicity, matching of type of expectations and achievement, type of expectation assessed, publication status, and informant. The analysis of cross-lagged effects indicated that parental expectations predicted change in child achievement, thus indicating that expectations had an effect over and above the effect of prior achievement. Effects of expectations on change in achievement were even stronger ( $r = .15$ ) than the effects of achievement on change in expectation ( $r = .09$ ). Parental expectations tended to be higher than the child achievement. Associations between expectations and achievement were partially mediated by educational expectations in the offspring, child academic engagement, and academic self-concept, and to a lesser extent, by parental achievement-supportive behaviors. We conclude that parents are recommended to communicate positive educational expectations to their children. The transmission of positive expectations to the offspring and the encouragement of academic engagement seem to be more effective in realizing parental expectations than parental behavioral academic involvement such as checking homework and staying in contact with teachers.”

## 3. Parent involvement, approaches to learning, and student achievement: Examining longitudinal mediation.

Anthony, C. J., & Ogg, J. (2019). Parent involvement, approaches to learning, and student achievement: Examining longitudinal mediation. *School Psychology*, 34(4), 376–385. <https://doi.org/10.1037/spq0000282>

*From The Abstract*

“Although there is evidence to suggest that parent involvement (PI) in children’s education positively impacts their academic success, the mechanisms of this effect are less well studied. One potential mechanism is a set of student-level motivational and behavioral factors labeled approaches to learning (ATL). The purpose of the current study was to utilize rigorous longitudinal methodology to evaluate whether ATL mediate the relationship between PI and student academic achievement. Using a large sample drawn from the Early Childhood Longitudinal Study—Kindergarten Cohort (ECLS-K), three sets of analyses were conducted focusing on three different types of PI (home-based involvement, school-based involvement, and home–school communication). Longitudinal mediation analyses indicated that only school-based involvement and home–school communication predicted student reading achievement and that this relationship was only mediated by ATL for school-based involvement. These findings contribute to the literature base on PI and represent a methodological advance to addressing these important mediational questions.”

#### 4. Are Parents Logged in? The Importance of Parent Involvement in K-12 Online Learning

Ricker, G., Belenky, D. & Koziarski, M. (2021). Are parents logged in? The importance of parent involvement in K-12 online learning. *Journal of Online Learning Research*, 7(2), 185-201. <https://www.learntechlib.org/primary/p/219541/>.

*From The Abstract*

“Among the many factors that impact student performance in traditional K-12 settings, parent involvement (PI) is consistently identified as critical for student success. However, less is known about parent involvement for full-time virtual schools, where most learning takes place asynchronously in a Learning Management System (LMS). The present study attempts to close this gap by using data from three virtual schools’ LMS to measure the impact of parent involvement on mathematics achievement, across grade bands where PI is known to vary. After controlling for factors known to impact education outcomes, parental involvement - as measured by LMS logins - had a small, but positive, impact on student performance in mathematics across elementary, middle, and high school. These results, coupled with the elevated role of the parent, suggest that parental involvement is just as critical, if not more so, in virtual schools as in traditional settings.”

#### 5. Remote or Removed: Predicting Successful Engagement with Online Learning during COVID-19

Domina, T., Renzulli, L., Murray, B., Garza, A. N., & Perez, L. (2021). Remote or removed: Predicting successful engagement with online learning during COVID-19. *Socius*, 7, 1-15. <https://doi.org/10.1177/2378023120988200>

*From The Abstract*

“Using data from a spring 2020 survey of nearly 10,000 parents of elementary school parents in one large southeastern public school district, the authors investigate predictors of elementary school student engagement during the initial period of pandemic remote learning. The authors hypothesize that household material and technological resources, school programming and instructional strategies, and family social capital contribute to student engagement in remote learning. The analyses indicate that even after controlling for rich measures of family socioeconomic resources, students with access to high-speed Internet and Internet-enabled devices have higher levels of engagement. Exposure to more diverse socioemotional and academic learning opportunities further predicts higher levels of engagement. In addition, students whose families remained socially connected to other students’ families were more likely to engage online.”

*From The Results’ Section*

“In particular, we find that student engagement with remote instruction improves with each additional mode of communication that parents report receiving from school, from a list that includes recorded telephone class, educational apps, social media such as Facebook, e-mail, parent-teacher association list servers, packages shipped via the U.S. mail, neighborhood list servers, Zoom or other Web-based meeting software, telephone calls, and school or district Web sites. Although these conditional associations are relatively modest in magnitude, each is statistically significant.”

## 6. Successful online learning: What does learner interaction with peers, instructors and parents look like?

Keaton, W. & Gilbert, A. (2020). Successful online learning: What does learner interaction with peers, instructors and parents look like?. *Journal of Online Learning Research*, 6(2), 129-154. <https://www.learntechlib.org/primary/p/215616/>

*From The Abstract*

“The student perspective in research done in online and STEM education is largely absent but is important for understanding how both of these areas can come together to best serve students. This study uses teacher ratings, school data and student interviews to investigate the perceptions students in online STEM courses have of their past and current educational experiences. Also, using an adaptation of Moore’s Framework of Interactions (Moore, 1989), the academic and extracurricular behaviors of these students are examined in relation to their interactions others, specifically instructors, parents and peers. It was found that the interactions that students have with these stakeholders are different in this setting as compared to a traditional learning environment. Teachers in online schools serve the role of a facilitator that students felt was important to their success, but was not their only source of instruction. Parents took on many roles in this setting, including monitoring, motivating, instructing and organizing. Learner-learner interaction looked the most different compared to traditional schools because these participants generally had little interaction with peers due to time and distance constraints. Implications of these findings for students, schools, education and research are given.”

*From The Conclusion*

“Because of the lack of physical presence of teachers and classmates, parents’ roles change a lot in the online school setting. According to the interviewed students, parental involvement ranges from no to daily monitoring, but a majority of students indicated that their parents had little involvement in their school. When comparing this involvement with the teacher ratings of each of the students, there does not seem to be a trend with the success level of students and their parental involvement. Some students specifically said that their parents were not involved, such as Heather who explained that this is how her education has been since she was young. The other end of the spectrum was Sam who had daily parental involvement, especially with organizing and monitoring. Many others said that their parents were peripherally aware of their progress, but allowed them to be independent. Parental involvement in this setting is exceptionally different from that of traditional education and parents can serve many different purposes depending on their own experiences and their child’s needs. Through these interviews, the four areas that stood out as roles held by the parents were organizing, monitoring, encouraging and instructing. Each of these were experienced to different degrees by the participants, but each of these categories was evidenced by multiple students explaining examples of how they interact with their parents.”

## 7. Parental contributions and assessment for learning as a component of mathematics homework

Williams, H., & Williams, K. (2020). Parental contributions and assessment for learning as a component of mathematics homework. *International Journal of Primary, Elementary and Early Years Education*, 50(2), 211-224. <https://doi.org/10.1080/03004279.2020.1842480>

*From The Abstract*

“Assessment for Learning (AfL) has long been identified as effective in supporting teachers to modify their teaching and learning with the aim of improving attainment but AfL practices are rarely applied to mathematics homework.



Parental involvement in learning is also a key ingredient to success. This paper explores the benefits of using AfL strategies within mathematics homework that harnessed the involvement of parents. Nine English primary schools piloted the use of mathematics homework projects that were based in the lived experiences of parents and children. A designated classroom changeover session was introduced to provide an opportunity for children, teachers and parents to practice AfL strategies within the context of mathematics homework. Findings suggest that changing the nature of the homework provided more opportunities for discussion in the home which resulted in higher quality engagement. Parents commented that there was reduced tension over homework as they were able to use their own calculation methods and children were more willing to see them as experts with this type of activity. Children more readily accepted feedback from parents and peers on how to improve their approaches.”

## Methodology

### ONLINE RESOURCES

We searched the Educational Resources Information Center (ERIC) database and Google Scholar.

### INCLUSION CRITERIA

We searched for high-quality resources that were published from 2013 to 2023. We considered the following when reviewing and selecting evidence.

1. peer-reviewed
2. type of evidence—experimental study, quasi-experiments, qualitative studies, mixed method studies, policy research, meta-analyses, literature reviews, and other sources (with an emphasis on empirical studies with learners, rather than theoretical research)
3. research sampling – diverse student representations, a minimum of 30 learners
4. target population (e.g., grade levels of interest), method of delivery, study duration, etc.
5. date of publication (e.g., focus on resources published in the last five years)

### LIMITATIONS

We recognize that this search is not exhaustive; other relevant sources may exist.

## Study Plan for SchoolsPLP

The next stage of the SchoolsPLP research pathway will be to design and conduct an empirical study. Empirical Education recommends working with a research organization to conduct a study designed to meet ESSA Tier 2 or Tier 3 evidence standards. A first step will be to discuss feasible designs based on existing implementation and locations (i.e., district and school customers) of product usage. Following feasibility determination, researchers will decide on research questions to address.

### RESEARCH QUESTIONS DESIGNED TO MEET ESSA TIER 3 EVIDENCE STANDARDS

1. Which SchoolsPLP usage metrics are the strongest predictors of outcomes?
2. Does the correlation of SchoolsPLP usage and student performance show promise of impact as defined in ESSA?
3. Is the potential impact stronger or weaker for different types of students?

### RESEARCH QUESTIONS DESIGNED TO MEET ESSA TIER 2 EVIDENCE STANDARDS

4. What is the impact of SchoolsPLP usage on student performance?
5. Is the impact stronger or weaker for different types of students?