Vermont Agency of Education Research Review

The Vermont Agency of Education Research Review is a compendium of research meant to provide evidence that supports the use of flexible pathway learning opportunities to promote positive student outcomes and postsecondary readiness, and to support LEA investment requests and Continuous Improvement Plans. This review was conducted at a national level and the research provided is not always a 1:1 correspondence with the Vermont programs cited in 16 V.S.A. § 941. The Vermont AOE Glossary defines the Flexible Pathway opportunities in accordance with Vermont statute and rules, and can be used as a reference throughout this document.

ESSA Levels of Evidence

The Every Student Succeeds Act (ESSA) defines four levels of evidence that are linked to the use of federal funds applied to educational activities, strategies and interventions. Having agreed-upon, consistent criteria for approving or denying federal education and state-funded grant requests across the AOE are critical to equitable awarding of funds. ESSA provides a precise definition of evidence that provides more clarity than prior requirements for "evidence based" practices or "scientifically research based" practices.

- Level 1 is strong evidence. Demonstrating this level of evidence requires identifying at least one well-designed and well-implemented experimental study that shows a significant positive impact on student outcomes (i.e., using randomized controls).
- Level 2 is moderate evidence. Demonstrating this level of evidence requires identifying at least one well-designed and well-implemented quasi-experimental study that shows a significant positive impact on student outcomes (i.e., matched study design).
- Level 3 is promising impact. Demonstrating this level of evidence requires at least one well-designed and well-implemented correlational study that shows a significant positive impact on student outcomes.
- Level 4 is "under evaluation". There are two criteria for this level of evidence. The first is that a compelling rationale can be provided based on high-quality research or positive evaluation that the practice is likely to improve student outcomes. The second is that there are on-going efforts to examine the effects of the practices on improving student outcomes.

This research review was conducted to provide a critical evaluation of existing evidence to support the use of flexible pathway experiences for positive student outcomes. This review is organized under the following categories to represent Vermont programs and to align with national research outcomes.

a. Dual Enrollment
b. Early College
c. Expanded/Extended Learning Opportunities
d. Online/Blended Learning
e. Work-Based Learning/Career and Technical Education
f. High School Completion/Credit Recovery

ESSA Levels of Evidence: An at-a-glance reference

The AOE has provided this table as a visual representation of the research review of existing materials in accordance with ESSA's Levels of Evidence that follows. This table represents the sole perspective of the Agency and has not been peer-reviewed or vetted by researchers.

Program or Intervention	Level 1	Level 2	Level 3	Level 4
Dual Enrollment	Solid RCT and Quasi-Experimental Evidence			
Early College		Substantial Quasi-Experimental Evidence		
Extended/Expanded Learning Opportunities			Limited Correlational Evidence	
Blended/Online Learning			Some Limited-Impact Correlational Evidence	
Work-Based Learning/CTE		Mix of strong correlational evidence and industry papers		
Credit Recovery/HS Completion				Unclear evidence, minus one strong study

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Research Review

Please note that some of the resources listed in the Research Review section have associated costs and are listed at the bottom of each table, breaking APA format.

Dual Enrollment

The term *dual enrollment* refers to students being simultaneously enrolled in two distinct academic programs or educational institutions, typically students enrolled in high school and college credit-bearing classes. In some locations, the term *concurrent enrollment* is used as a synonym for *dual enrollment*, however, in Vermont we have a state-wide dual enrollment program. The Vermont Dual Enrollment Program includes college courses offered on the campus of an accredited postsecondary institution, on a secondary school campus, and may include online courses. Of the Flexible Pathway opportunities addressed in 16 V.S.A. § 941, dual enrollment has one of the most robust evidence bases and shows the largest number of consistent effects on student outcomes, as judged by evidence from the What Works Clearinghouse (WWC). Dual Enrollment is also one of the most researched of those listed in this review, with a mix of randomized controlled trial research studies (a gold standard for social science research) and other mixed-methods studies.

Of all the Flexible Pathway opportunities provided in this review dual enrollment has the most consistent positive impact on access and enrollment, high school degree attainment, school completion, credit accumulation, and general increases in academic achievement. Studies have shown that students with dual enrollment experience also have somewhat higher levels of high school attendance and readiness for college than other students.

NOTE: Many studies combine dual enrollment and early college as part of their collective research and reviews.

Study Name/Authors	Description and Any Noted Outcomes
Struhl, B., & Vargas, J. (2012). Taking college courses in high school: A strategy guide for college readiness—The college outcomes of dual enrollment in Texas Washington, DC: Jobs for the Future.	A quasi-experimental study, showing that dual enrollment increased access to and enrollment in college, and limited increases in college achievement.
Berger, A., Turk-Bicakci, L., Garet, M., Song, M., Knudson, J., Haxton, C., Zeiser, K., Hoshen, G., Ford, J., Stephan, J., Keating, K., & Cassidy, L. (2013). Early college, early success: Early College High School Initiative Impact Study. Washington, DC: American Institutes for Research. *	An impact study, showing that students who attended early college and dual enrollment programs had higher graduation, college-going, and college-completion rates.

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Edmunds, J. A., Unlu, F., Glennie, E., Bernstein, L., Fesler, L., Furey, J., & Arshavsky, N. (2017). Smoothing the transition to postsecondary education: The impact of the early college model. *Journal of Research on Educational Effectiveness, 10*(2), 297–325, DOI	A study, showing that early college leads to attendance increases and to increased access to and enrollment in college.
Giani, M., Alexander, C., & Reyes, P. (2014). Exploring variation in the impact of dual-credit coursework on postsecondary outcomes: A quasi-experimental analysis of Texas students. *High School Journal*, 97(4), 200–218.	A quasi-experimental study, showing increases in enrollment in college.

Early College

Early college is often considered synonymous with dual-enrollment programs, and in academic literature and research, the two terms are used interchangeably by many researchers. The VT AOE Glossary defines Early College as full-time enrollment by a 12th grade Vermont student for one academic year in a program offered by a partnering postsecondary institution. The student receives credit from the secondary school and from the postsecondary institution. The following listed studies specifically highlight the impacts of early college programs evaluated across the United States by national research organizations. Overall, research evidence shows that early college programs have strong effects on student learning and persistence outcomes: students who participate in early college are more likely than non-participating students to graduate on time, enroll in college after finishing high school, and obtain a college degree.

Study Name/Authors	**Description and Any Noted Outcomes**
Berger, A., Turk-Bicakci, L., Garet, M., Song, M., Knudson, J., Haxton, C., Zeiser, K., Hoshen, G., Ford, J., Stephan, J., Keating, K., & Cassidy, L. (2013). Early college, early success: Early College High School Initiative impact study. Washington, DC: American Institutes for Research.	An impact study, showing that students who attended early college and dual enrollment programs had higher graduation, college-going, and college-completion rates.
Struhl, B., & Vargas, J. (2012). Taking college courses in high school: A strategy guide for college readiness—The college outcomes of dual enrollment in Texas. Washington, DC: Jobs for the Future.	A quasi-experimental study, showing that dual enrollment increased access to and enrollment in college, and was associated with some increase in college achievement.

Brody, L. E., & Muratori, M. C. (2014). *Early entrance to college: Academic, social, and emotional considerations*. In S. G. Assouline, N. Colangelo, J. VanTassel-Baska, & A. Lupkowski-Shoplik (Eds.), *A nation empowered: Evidence trumps the excuses holding back America's brightest students* (pp. 97–107). Iowa City, IA: Acceleration Institute.	Non-peer-reviewed paper on the impacts of early college entrance programs, suggesting positive academic and social-emotional learning effects for students in college.

Expanded/Extended Learning Opportunities

Expanded or extended learning opportunities refers to educational experiences that lengthen the amount of time that students spend engaged in learning. Many of these experiences take place after school or during school hours in a community setting. *Extended learning opportunities* may refer to extended school days, while *expanded learning opportunities* may refer to programs or activities that are not part of the official school day but that expand academic learning opportunities. Vermont uses the term *expanded learning opportunities* to mean high quality programs within communities and schools designed to serve learners on a regular basis by providing unique opportunities for academic growth, hands-on learning, and personal development. Often these programs are provided by schools in collaboration with non-profit organizations, museums, and other local entities. These opportunities can occur beyond traditional school hours and outside of the school building. The research regarding extended/expanded learning is complex: time spent learning is often the most measured unit in these studies, and research has shown that increased learning time has a strong impact on student achievement. However, much of the research has also shown that the *quality* of that learning time significantly impacts the results of increasing time spent learning.

Study Name/Authors	Description and Any Noted Outcomes
Callahan, M. K., Meehan, K., Kim, D. Y., & Westmaas, L. (2016). Results from a two-year study of the effects of extended learning opportunities on student outcomes in New Hampshire. Philadelphia, PA: Research for Action.	This research is a mix of a program evaluation and an impact study, and therefore, results may not be applicable for all contexts. The study gives insights into New Hampshire's extended learning opportunities process, structures, and lessons learned.

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Hanover Research. (2013). [Review of expanded learning opportunities](). Washington, DC: Author.	A literature review and analysis, showing a correlational link between extended learning schedules and student success, and concluding that additional learning hours, controlled for quality, are positively related to student achievement.
Redd, Z., Boccanfuso, C., Walker, K., Princiotta, D., Knewstub, D., & Moore, K. (2012). [Expanding time for learning both inside and outside the classroom: A review of the evidence base](). Bethesda, MD: ChildTrends.	A literature review of existing expanded learning opportunity initiatives, with policy implications and considerations for funding.
Checkoway, A., Gamse, B., Velez, M., & Linkow, T. (2013). [Evaluation of the Massachusetts Expanded Learning Time (ELT) initiative: Final study findings](). Evanston, IL: Society for Research on Educational Effectiveness.	A study of expanded learning time (ELT) in Massachusetts showing no statistically significant effects on student achievement. Teachers reported satisfaction with increased instructional time.

Online/Virtual/Blended Learning

The AOE defines Blended Learning as an education program in which content and instruction are delivered both in a traditional classroom setting and through virtual learning that allows for student choice around time, place, path, and/or pace. Virtual Learning is delivered through a Web-based platform that employs a variety of digital tools, content, and supports and allows for student choice around time, place, path, and/or pace. Virtual learning can facilitate both individual and collective learning, and can occur synchronously and asynchronously. As an example, the [Vermont Virtual Learning Cooperative (VTVLC),](https://) works with Vermont schools to provide access to the course's students want by offering them online. VTVLC's [FY19 End of Year Report]() provides course enrollment data broken out by course content, student demographics, and program offerings.

Currently, there is limited evidence to support the effect of full-scale models of blended learning or online learning on student outcomes. Some of the studies available are very content specific; for instance, blended math intervention programs have shown promising results. However, the use of blended learning as the backbone of an entire curricular design may not be currently substantiated through existing research, as the field of research is somewhat limited to small programmatic interventions rather than a full-scale model. Blended learning as a curricular intervention is still being studied by many organizations, to understand the impact of this strategy in a whole-school and whole-classroom model. Some evidence, showing insignificant or negative results in terms of increases in student outcomes, can be found in studies of adult learning settings, but these results may not be applicable to learning in a K–12 environment.

Eryilmaz, M. (2015). *The effectiveness of blended learning environments*. Contemporary Issues in Education Research, 8(4), 251–256. *****	A study on a college computer science course applied in a blended learning environment showing that students self-reported better engagement through blended learning than with face to face learning environments.
Enyedy, N. (2014). Personalized instruction: New interest, old rhetoric, limited results, and the need for a new direction for computer-mediated learning. Boulder, CO: National Education Policy Center.	A peer-reviewed paper, showing the negative effects of blended learning.
Steele, J. L., Lewis, M. W., Santibanez, L., Faxon-Mills, S., Rudnick, M., Stecher, B. M., & Hamilton, L. S. (2014). Competency-based education in three pilot programs: Examining implementation and outcomes. Santa Monica, CA: RAND Corporation.	A RAND study of several competency-based education pilot sites that used a mix of project-based and virtual learning, showing achievement declines for online math programs but a significant increase in student attendance for project-based learning.
Patrick, S., Kennedy, K., & Powell, A. (2013). Mean what you say: Defining and integrating personalized, blended and competency education. Vienna, VA: International Association for K–12 Online Learning.	A study focused on defining and clarifying blended learning, with little peer-reviewed evidence of student outcome effects.
Wang, H., & Woodworth, K. (2011). Evaluation of Rocketship Education's use of DreamBox Learning's online mathematics program. Menlo Park, CA: SRI International, Center for Education Policy.	A program evaluation, showing impacts on math achievement for K–1 students of the Rocketship Education Implementation Model.
Means, B., Toyama, Y., Murphy, M., Bakia, M., & Jones, K. (2010). Evaluation of evidence-based practices in online learning: A meta-analysis and review of online learning studies. Washington, DC: U.S. Department of Education, Office of Planning, Evaluation, and Policy Development, Policy and Program Studies Service.	A 12-year longitudinal study, showing varying effects of blended learning on student outcomes.

Work-Based Learning and Career Technical Education

Work-Based Learning in Vermont is defined as an educational program or experience involving student interactions with industry or community professionals in real, virtual, online, or simulated work environments that exposes learners to postsecondary options, provides opportunities for skill development and proficiency attainment, and allows students to reinforce and deepen their school-based learning. Career Technical Education (CTE) is an educational program that supports attainment of a high school diploma, designed to provide

students with technical knowledge, skills and aptitudes that will prepare them for further education and enhance their employment options or lead to an industry-recognized credential. CTE in Vermont is available to high school students through 17 regional CTE centers.

Much of the research on work-based learning has been coordinated by industry organizations (e.g., Advance CTE), but this research has been peer reviewed and affirmed by the U.S. Department of Education. With that said, the studies of work-based learning are commingled with those of career and technical education (CTE), despite the notable differences between the two interventions.

Study Name/Authors	Description and Any Noted Outcomes
Dougherty, S. M. (2018). *The effect of career and technical education on human capital accumulation: Causal evidence from Massachusetts*. Education Finance and Policy, 13(2), 119–148.	A quasi-experimental study, showing that participation in a high-quality CTE program boosts the probability of on-time graduation from high school by 7 to 10 percentage points for higher-income students and has a greater effect on high school graduation for low-income students.
Yeado, J. (2017). Building bridges: An analysis of career and technical education in metro Milwaukee. Milwaukee, WI: Public Policy Forum.*	A report on CTE programs in Milwaukee, with policy recommendations.
Advance CTE: State Leaders Connecting Learning to Work. (2016). Measuring work-based learning for continuous improvement. Connecting the classroom to careers: The state's role in work-based learning. Silver Spring, MD: Author.	A report, showing examples from West Virginia, Tennessee, and Massachusetts that demonstrate either a systems-level or student-level approach to measuring work-based learning activities.
Dougherty, S. M. (2016). High school career and technical education participation and initial college enrollment: Evidence from Arkansas. Evanston, IL: Society for Research on Educational Effectiveness. *	A study from Arkansas, showing that students who participated in CTE programs had a higher probability of enrolling in college.
Arnold, K. D., Soto, E. B., Wartman, K. L., Methven, L., & Brown, P. G. (2015). Post-secondary outcomes of innovative high schools: The Big Picture Longitudinal Study. Boston, MA: Boston College.	A longitudinal study, showing positive effects on the English language arts achievement of the students at Big Picture schools, and mixed results in the areas of science and mathematics college readiness and in six-year college persistence rates.

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Cahill, C., Hoffman, N., Loyd, A., & Vargas, J. (2014). State strategies for sustaining and scaling grades 9–14 career pathways: Toward a policy set for Pathways to Prosperity. Boston, MA: Jobs For the Future.	A policy brief, describing policies that could be deployed in the service of grades 9–14 career pathways development, but that are not currently widespread or designed specifically to support career pathways for these grades.
Castellano, M., Stone, J. R., III, Stringfield, S., Farley-Ripple, E. N., Overman, L. T., & Hussain, R. (2007). Career-based comprehensive school reform: Serving disadvantaged youth in minority communities. Columbus, OH: National Research Center for Career and Technical Education.	A five-year longitudinal study, showing that the odds of a student dropping out of high school declined as the proportion of the high school experience invested in CTE courses increased.
Kemple, J. J., & Snipes, J. C. (2000). Career academies: Impacts on students' engagement and performance in high school. New York, NY: Manpower Demonstration Research Corporation.	A large-scale, multi-site, random-assignment research project measuring the impact of career academies on student outcomes. Findings showed that career academies increased both the level of interpersonal support that students experienced and their participation in career awareness and work-based learning activities; substantially improved high school outcomes among students at high risk of dropping out; and increased the likelihood of students least likely to drop out graduating on time.

High School Completion/Credit Recovery

While Vermont statute does not identify credit recovery as a flexible pathway to secondary school completion, the Vermont's High School Completion Program (HSCP) is designed to offer a flexible pathway to those at least 16 years of age and at risk of disengaging from school or have already dropped out of school. The HSCP provides learners with educational services of the scope and rigor needed for the attainment of a Vermont high school diploma. Since the HSCP is unique to Vermont, there are no currently available study reviews through WWC.

Credit recovery and the HSCP are not synonymous nor should the HSCP be treated as a credit recovery program. What follows below could provide useful information when making decisions about the value of credit recovery for students off-pace or with lagging skills, and when making decisions about engaging in any specific flexible pathway.

The What Works Clearinghouse (WWC) lists no studies that meet its requirements for a quasi-experimental design to study and assert the impacts of credit recovery programs. WWC describes nine studies that do not meet its standards for design, and therefore does not assign a designation of the impact of credit recovery programs.

In addition, the U.S. Department of Education released, based on survey responses from the National Survey on High School Strategies Designed to Help At-Risk Students Graduate (March

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2018). The issue brief details the programmatic interventions used by high schools across the country to help students recover credits and complete high school. Most of the surveyed schools used an online class format (71%) or a blended model (46%) for instruction. The results of credit recovery-programs seem tied to the programmatic outcomes of blended and online learning strategies.

Study Name/Authors	Description and Any Noted Outcomes
Sinclair, M. F., Christenson, S. L., & Thurlow, M. L. (2005). *Promoting school completion of urban secondary youth with emotional or behavioral disabilities*. Exceptional Children, 71(4), 465–482.	An experimental study, showing that the Check and Connect program contributed to lower rates of dropout and mobility, higher rates of persistent attendance and enrollment status in school, and more comprehensive transition plans.
USED Office of Planning, Evaluation and Policy Department (2017). *National Survey on High School Strategies Designed to Help At-Risk Students Graduate*.	The U.S. Department of Education sponsored the National Survey on High School Strategies Designed to Help At-Risk Students Graduate. The survey results informed these USED briefs that provide descriptive information on the prevalence and characteristics of strategies designed to help at-risk students graduate from high school.

Considerations for Equity in the Development and Implementation of Flexible Pathways

- Much of the literature described in this review suggests that a clear vision for success, coupled with thoughtful implementation of programmatic interventions (such as CTE or expanded learning opportunities), will yield a higher rate of success for students. One reason for the positive results could be the concentration of staff time and resources on a smaller number of Flexible Pathway programs (e.g., CTE and expanded learning opportunities only). Additionally, it is important to note that many research studies look at interventions individually, and these studies sometimes exclude some of the broader school conditions and behaviors that impact implementation.

- The National Center for Learning Disabilities (NCLD) published a policy and practice guide on meeting the needs of students with disabilities in developing personalized learning. NCLD conducted a policy and best practices landscape scan that examined research and practice evidence to determine best practices for students with disabilities. Much of the research draws on the principles of Universal Design for Learning, which focus on designing personalized, competency-based educational programs around the needs of all students, including students with disabilities and English language learners,

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and not to back-map or retrofit. This recommendation seems especially important for the work of SUs/SDs as they embark on designing and implementing flexible pathways.

- iNACOL has compiled a [brief](#) on next-generation learning models for English language learners, including some helpful design considerations, included in the following table from the brief.

Competency-Based Education and Designing for English Language Learners

Definition design elements for competency-based education systems	ELL considerations	Competency-based education system for ELL students
Students advance upon demonstrated mastery.	Education programs serving ELL students need to meet every learner where they are, in both academic content and language development, and make sure they grow and progress.	ELL students receive the time, instruction, strategies and supports, as needed, to reach mastery in language development, literacy and academic content.
Competencies include explicit, measurable, transferable learning objectives that empower students.	ELL students benefit from the integration of content standards and language development standards and tools to help them access content learning objectives.	Competencies for ELL students include those for language, literacy and academic content.
Assessment is meaningful and a positive learning experience for students.	Assessments generate feedback for ELL students and provide next steps in language development and content learning objectives.	Assessments for ELL students are ongoing, aligned with both English language development standards and academic standards.
Students receive timely, differentiated support based on their individual learning needs.	Instructions, supports, interventions take into account ELL students' entry points (language development level, prior knowledge, etc.).	ELL students receive targeted feedback and strategies based on their specific language and academic learning needs.
Learning outcomes emphasize competencies that include application and creation of knowledge, along with the development of important skills and dispositions.	Definition of student success is broadened for ELL students to include language, academic and lifelong learning skills.	In addition to enhancing students' language, literacy and academic learning, ELL students also receive support in the skills and dispositions essential to success.

* Note: Any research item with an * was found by REL Northeast & Islands Ask-A-REL Response: Research on Flexible Pathways to College, February 2019.