The Launch Years Initiative: State-Level Strategies to Reimagine Mathematics Education

February 2022

In May 2019, the Charles A. Dana Center at the University of Texas (Dana Center), in collaboration with Education Strategy Group (ESG), Achieve, Community College Research Center, and the Association of Public & Land Grant Universities and with support from the Bill & Melinda Gates Foundation, started the Launch Years initiative, an ambitious national effort to reimagine mathematics education in high school and usher in a new paradigm for postsecondary readiness in mathematics.[1] The goal of this work is to dramatically scale high-quality mathematics courses with rigorous, relevant, and engaging content; culturally and pedagogically inclusive instruction; and multiple and flexible high school to postsecondary mathematics pathways designed to better prepare students – especially African American, Latinx, and Native American students and also students in lower-income communities – for mathematics attainment and continuous achievement. In order to accomplish this goal, K-12, higher education, and workforce partners and equity advocates must work together to establish the conditions necessary for every student to succeed.[2]

Over the past several years, the Launch Years initiative has created consensus among cross-sector partners regarding a new vision for mathematics pathways in high school, articulated principles related to enhancing and access, and presented strategic recommendations in a comprehensive report entitled Launch Years: A New Vision for the Transition from High School to Postsecondary Mathematics. Additionally, the Dana Center convened K-12 and postsecondary mathematics educators to develop a Modern Algebra II Course Framework and create a Transition to College Mathematics Course Framework that include course design principles for high school courses; sample student learning outcomes; identification of skills that are important for students' social, emotional, and academic development; and a suggested scope and sequence.[3] Lastly, the Dana Center and ESG supported the efforts of local, regional, and state leaders in Georgia, Texas, and Washington to establish a statewide vision for mathematics.

In particular, ESG worked with representatives from state education agencies, institutions and systems of higher education, and workforce entities to build on successful efforts to date and identify short- and long-term opportunities for collective action. The primary outcomes of this engagement with state partners are the development of state-level recommendations related to key domains of work including enhancing the content, structure, and sequence of high school and postsecondary mathematics courses; continually enhancing the capacity of mathematics instructors; establishing and implementing differentiated mathematics pathways for all students across the state; and institutionalizing effective cross-sector partnerships. In addition, ESG has identified essential conditions that should be established and action items that should be executed by state-level entities to ensure that strategies will be implemented effectively, with fidelity, and sustained over time.

The purpose of this brief is to present detailed information about ESG engagement with the partner states and the outcomes of this work, as well as to offer questions to guide further work.

ENGAGEMENT WITH STATE LEADERS

ESG engagement with our state colleagues, which was initiated in the fall of 2019, was anchored in the following principles:

- Maximize the expertise and experience of state leaders;
- Build on and scale promising and successful strategies;
- Maximize human, fiscal, organizational, and other types of resources; and
- Establish or enhance cross-sector partnerships among K-12, higher education, and workforce entities and empower leaders to set the stage for productive collaboration, enhanced alignment, and sustained change.

These principles and the following strategies could serve as a useful framework for leaders who are interested in engaging in similar work in their respective states.

Selection of State Partners. State leaders were invited to submit applications to be selected as partner states for the Launch Years initiative and Georgia, Texas, and Washington were selected based on the following primary criteria: 1) evidence of early successes and implementation of innovative practices related to enhancing the content, structure, and sequence of high school and postsecondary mathematics courses and/or establishing differentiated multiple, flexible, and differentiated pathways; 2) state and/or regional examples of effective collaboration among K-12, higher education, workforce, and other partners; and 3) commitment among cross-sector representatives to serve as thought partners with the Launch Years coalition, pilot promising strategies, and develop statewide short- and long-term recommendations.

Steering Committees. The primary agent of change and innovation for each state was a Steering Committee comprised of leaders from the K-12, higher education, and workforce sectors and other stakeholders including mathematics instructors from different regions and representatives from statewide professional associations. The Dana Center also established Launch Years Regional Task Forces to support the implementation of the Transition to College Mathematics Framework in Floyd County, GA; central Texas; and Spokane, WA.

Our contacts for the Steering Committees represented the following agencies and organizations: in Georgia, the Georgia Department of Education (GaDOE), the University System of Georgia, and the Technical College System of Georgia; in Texas, the Texas Education Agency (TEA) and the Texas Higher Education Coordinating Board; and in Washington, the Office of Superintendent of Public Instruction (OSPI), State Board for Community and Technical Colleges (SBCTC), and the Washington State Council of Presidents.

ESG worked with these contacts to identify potential members and ensure that the committees included a diverse set of representatives from different sectors and constituencies, and the Steering Committees were established during the fall of 2019.

The Committee members' primary responsibility was to identify policies and strategies to improve the alignment of students' high school mathematics experiences with their college and career aspirations, increase opportunities that can accelerate students' progress toward a credential of value, and ensure that multiple stakeholders understood the value of high school mathematics pathways. Each Steering Committee was charged with producing a set of public recommendations about the policy and programmatic supports necessary to scale high school to postsecondary mathematics pathways.

Building the Foundation for the Work. ESG conducted two primary activities to provide key stakeholders and Steering Committee members with information about the Launch Years initiative, establish collective ownership, and identify strategic entry points for cross-sector discussions.

In partnership with the co-chairs for the Committees, we identified our expectations and anticipated outcomes and defined our responsibilities related to advancing the work. In addition, we conducted meetings with the leaders of K-12, higher education, and workforce agencies and organizations to share information about the purpose and primary goals of the initiative and present potential opportunities for collaboration; in particular, we identified areas of alignment with agency/organizational initiatives and how the Launch Years work would build on legislative, policy, and statewide and regional efforts.

Second, we conducted virtual interviews with Steering Committee members across the partner states to learn about their interests and priorities related to enhancing the quality of mathematics education and identify issues and challenges that need to be addressed. We developed an interview protocol that included questions about the primary barriers to the successful completion of high school mathematics courses, which students were most affected by these barriers, and opportunities and challenges related to the creation of enhanced mathematics courses and multiple pathways. ESG conducted forty-six interviews prior to the first Steering Committee meetings for each state and presented detailed findings to the members.

There were notable similarities in the members' responses across the three states. The members cited students' lack of foundational knowledge and preparedness plus negative mindsets about mathematics; variance regarding instructional and assessment strategies and access to instructional, staff, and fiscal resources; and the content, structure, and sequence of mathematics courses (particularly Algebra courses) as the primary barriers to the successful completion of high school mathematics courses – and the students disproportionately affected are students of color, particularly African American and Latinx students; students in lower-income communities; English language learners; and students with disabilities. There was also consensus on key issues such as concerns about aligning the content of high school and postsecondary mathematics courses; establishing flexible pathways for students; eliminating policies that create and magnify inequities such as student tracking; and implementing initiatives with fidelity given limited access to fiscal, staffing, and other resources.

The interviewees demonstrated agreement about significant opportunities for innovation and change:

- Empower students to develop growth-based attitudes about mathematics and changing the mindsets of educators, parents/family members, and community members;
- Increase the value, relevance, and applicability of mathematics and its relationship to different postsecondary options;
- Identify mathematics competencies necessary to pursue these options and create differentiated, flexible, and equally rigorous pathways;
- Enhance mathematics content and pedagogy by providing continuous, job-embedded professional learning opportunities to high school and postsecondary instructors;
- Significantly increase equity and access by addressing implicit biases and dismantling institutional/organizational and systemic barriers to attainment and achievement; and
- Create opportunities for structured and sustained collaboration between K-12 and higher education partners to align content and instructional practices, provide enhanced academic and other types of support services to students, secure buy-in and ownership for the work, and maximize fiscal, staffing, and other types of resources.

ESG used the interview findings to guide our planning activities, identify potential entry points and priorities for each state, and develop the agendas for the Steering Committee meetings.

Steering Committee Meetings. In collaboration with Dana Center colleagues, ESG facilitated two in-person meetings in Georgia in October 2019 and February 2020 and one in-person meeting in Washington and Texas in January 2020 and February 2020 respectively. At each of the first meetings, Steering Committee members presented detailed information about ongoing initiatives related to the establishment of mathematics pathways and current mathematics courses and pathways and also detailed state-level data about student enrollment, attainment, and achievement in mathematics courses. Dana Center staff members presented detailed information about the Launch Years initiative and ESG presented the interview findings. The purpose of these presentations was to establish a common language, expectations, and framework for the Steering Committee members. During the first in-person meetings, the members collectively discussed opportunities for change and short-term priorities which resulted in the identification of key domains of work and the creation of subcommittees to develop initial recommendations: in Georgia, mathematics courses and pathways, educator capacity, student supports and guidance, and transitions between K-12 and higher education; and in Texas, mathematics courses and pathways, educator capacity, student support, and K-12 and higher education alignment. For Washington, ESG was tasked with proposing subcommittees based on an analysis of the meeting summary and interview findings.

Impact of the Covid-19 Pandemic. The Covid-19 pandemic resulted in significant shifts in the implementation of the Launch Years initiative and ESG collaborated with our partners to appropriately advance the work while recognizing that our colleagues' time, attention, and energy would be focused on supporting students and grappling with a multitude of unanticipated issues and challenges.

As such, the work progressed differently in the three states. In Washington, ESG and OSPI convened a virtual Steering Committee meeting in December 2020 and subcommittee meetings during the spring of 2021 which resulted in a set of recommendations that were presented to state leaders in June 2021. In Georgia and Texas, we did not have the opportunity to schedule additional meetings; but for Georgia, we developed proposed recommendations based on the discussions at the in-person Steering Committee meetings plus subcommittee meetings that were conducted virtually in January 2020. Additionally, we provided support to the state as it moved toward mathematics standards revisions that aligned with the goals of this initiative (described in the following section of this brief). In Texas, our discussions with state leaders resulted in the identification of potential domains of work and opportunities to leverage regional efforts and cross-sector partnerships.

Another outcome of our engagement with state leaders during the first phase of the pandemic was the development of a policy brief; our colleagues at the GaDOE, TEA, OSPI, and SBCTC participated in virtual interviews and provided detailed information about strategies to offer mathematics courses in virtual and hybrid learning environments, provide different types of professional learning opportunities for educators, and address critical issues of equity and access.[4]

OUTCOMES OF THE WORK

Greater consensus among K-12, higher education, and workforce partners. The Steering Committee and subcommittee meetings created important opportunities for local, regional, and state leaders to identify common issues and concerns, discuss both promising and effective strategies, and identify current initiatives that are aligned with the Launch Years work. The convenings amplified the necessity and benefits of reimagining mathematics education and establishing new or enhanced pathways for students.

State recommendations and strategies. Our work with our state partners resulted in the presentation of Steering Committee recommendations to the State Superintendent of Public Instruction, the Executive Director of the State Council of Presidents, and the Executive Director of the SBCTC in Washington; proposed recommendations that ESG presented to state leaders at the GaDOE; and the presentation of priority areas and strategies to scale regional efforts in Texas to the Dana Center. The following is a summary of the recommendations across the partner states.

Strengthening cross-sector collaboration and alignment is an important domain of work for all three states and primary strategies are as

follows: 1) create statewide networks of high school and postsecondary mathematics instructors, counselors and advisors, and administrators to share information about effective practices and address barriers to mathematics attainment and achievement; 2) provide continuous professional learning opportunities for high school and postsecondary mathematics instructors – developed jointly by K-12 and higher education partners – to enhance content and instructional strategies and implement culturally relevant pedagogy; 3) revise higher education admissions policies and course assessment and placement strategies to reflect changes to high school mathematics courses and sequences and increase students' access to rigorous and credit-bearing courses; and 4) modeled after the Launch Years Regional Task Forces and existing partnerships (such as the Central Texas Mathematics Alignment Taskforce and the Spokane Math Symposium), establish regional mathematics councils that would be charged with continually assessing the content and structure of high school and postsecondary courses and increasing alignment.

Revising the content of high school mathematics courses and creating new pathways is also a priority in all three states. Despite the fact that mathematics is becoming increasingly important to multiple fields of study and there is a growing demand for people with a wide array of strong mathematical skills, students' mathematical experiences do not sufficiently prepare them to utilize mathematics in diverse ways.[5] In particular, the content of both high school and postsecondary mathematics courses do not reflect important shifts with regard to the types of knowledge and skills that are needed to successfully pursue opportunities in different industries. In addition, mathematics courses do not have equal rigor and value. Strategies to revise course content and establish pathways include reducing the number of high school mathematics courses and organizing them into coherent and clearly defined pathways that are directly aligned with postsecondary opportunities, ensuring that new pathways are flexible and increase rather than limit students' ability to pursue different types of opportunities, and identifying specific sequences of high school and postsecondary courses for students who are interested in pursuing different types of opportunities.

An important strategy for engaging in this work is modernizing and restructuring Algebra II given that the course is foundational for multiple pathways, frequently required for admission to postsecondary institutions, and often serves as a gatekeeper course that disproportionately prevents students of color, students in lower-income communities, and other subgroups from enrolling in advanced courses.

In August 2019, the Office of the Governor and the GaDOE launched a "citizen-led, student-focused effort"[6] to revise K-12 academic standards for English Language Arts and mathematics. The GaDOE administered a survey to request feedback about the current mathematics standards, convened working committees of teachers across the state, and also convened citizens and academic review committees; the revised standards were developed by mathematics teachers and adopted in August 2021.[7]

Algebra II is the last course in a sequence of three high school courses that are designed to enable multiple fourth year options that are related to their career interests,[8] and the revised standards include enhanced content to better ensure that students will gain the knowledge and skills needed to successfully pursue these options.

For Washington, strategies to modernize Algebra II include the following: 1) redefine the purpose of Algebra II and examine its impact on students' access to postsecondary opportunities; 2) incorporate quantitative reasoning, data science, and other topics into the course to create a universal foundation for all high school students and ensure that they can successfully pursue a range of advanced courses; 3) incorporate culturally relevant pedagogy, contextualize learning experiences, and enhance the applicability and relevance of the course; and 4) define common content and student learning outcomes across all school districts and align them with postsecondary admission, placement, and academic requirements.

Additional domains of focus arose in each state. Washington focused discussions on how best to leverage workforce partnerships to increase students' understanding of the applicability and relevance of mathematics and connect mathematical experiences to career interests, and primary strategies include defining what types of mathematical practices and skills are required to pursue jobs in different industries and collaborating with workforce partners to provide professional learning opportunities to mathematics instructors, create experiential learning opportunities for students, and enhance course content and pedagogy.

Georgia discussions prioritized enhancing educator capacity and providing comprehensive support to both high school and postsecondary students. Strategies to support educators include redesigning teacher preparation programs to enhance the content knowledge and skills of aspiring educators particularly related to data science, statistics, and financial literacy and increase their understanding of mathematics pathways; providing continuous and linked opportunities for all high school and postsecondary mathematics instructors related to culturally relevant pedagogy, social and emotional development, quantitative skills, and financial literacy; establishing statewide standards related to the content and quality of professional learning opportunities and the qualifications of providers; expand professional learning communities for mathematics instructors; and establish opportunities for mathematics instructors to co-develop revised instructional resources for mathematics courses. Student support strategies include providing individualized and asset-based academic, career, and other types of support to high school and postsecondary students; assessing multiple types of data to provide targeted support to students who are most in need of assistance; providing professional learning opportunities to high school and postsecondary counselors and advisors; and creating ongoing opportunities for these counselors and advisors to share information about effective practices and identify opportunities for collaboration.

Based on initial discussions with state leaders and local practitioners, the following four domains of work remain a priority for Texas: enhancing high school and postsecondary student advising; addressing learning loss and the disproportionate impact on students of color, enhancing partnerships among K-12, higher education, and workforce partners to increase the relevance and applicability of mathematics; and scaling a single 12th grade mathematics transition course across all school districts. We engaged in conversations about how to leverage existing regional partnerships to drive the work, but unfortunately the pandemic hindered further discussion and action.

Essential Conditions for Implementation. Based on our work with our state colleagues, we have identified the following conditions that should be established and action items that should be executed by state-level K-12, higher education, and workforce entities to ensure that strategies will result in positive and sustainable outcomes.

Identify and Mobilize Leaders

Strong and sustained commitment on the part of K-12, higher education, and workforce leaders; policymakers; and other key stakeholders at the local, regional, and state levels is necessary to successfully implement new strategies, increase equity, and eliminate the policies and structures that have disproportionately affected students who are Black, Latinx, and Native American students, or reside in lower-income communities and prevented their pursuit of multiple postsecondary opportunities.

Identify individuals across the K-12, higher education, and workforce sectors who will:

- Articulate specific roles and responsibilities for key stakeholders and identify timeframes for implementing strategies;
- Advocate for fiscal and other resources to support the successful implementation of these recommendations and sustain the work;
- Develop and implement a strategic communications plan to broadly disseminate information about reform efforts and engage community members in ongoing discussions about the necessity and added value of redesigned mathematics courses and pathways;
- Organize a long-term coalition of cross-sector education, policy, and workforce stakeholders to champion the establishment of new mathematics courses and pathways and contribute to ongoing work;
- Specify how equity and educational justice will be central to implementing recommendations in order to address structural barriers impacting traditionally marginalized students; and
- Embed issues of equity and access into every aspect and domain of work; create consensus among K-12, higher education, and workforce partners about priorities related to these issues and identify specific short- and long-term objectives; eliminate policy, organizational, and other factors that impede equity and access; and enhance individual, collective, and organizational capacity to proactively address these issues.

Build Capacity Across Sectors

Resources coupled with ongoing training and support are necessary to enable mathematics instructors, school and district administrators, higher education leaders, business and industry partners, and other stakeholders to develop and successfully implement new strategies.

- Conduct analyses of professional development resources related to the content and pedagogy of new and enhanced mathematics courses and regularly assess the professional learning priorities of mathematics instructors.

- Assess the availability of instructional, curricular, and assessment materials to support the implementation of newly redesigned mathematics courses and pathways and implement cross-sector strategies to provide different types of continuous and job-embedded services to mathematics instructors.

- Assess school districts and higher education institutions to determine levels of readiness and capacity to engage in and sustain the work.

- Identify effective local or regional pathways initiatives and build on successful elements to enhance, scale, and sustain these practices.

- Establish a statewide infrastructure to institutionalize the work and cross-sector collaboration by creating organizational processes and practices that can withstand change related to leadership and political factors.

- Maximize existing fiscal, staff, and other resources and provide additional resources as necessary.

Conduct Ongoing Analyses of Data

K-12, higher education, and workforce partners must continually analyze multiple types of data to accurately assess the state of mathematics education and implement data-driven strategies.

- Establish the cross-sector data infrastructure and working partnerships necessary to share data and conduct joint analysis.

- Analyze disaggregated student enrollment, attainment, and achievement data for both high school and postsecondary mathematics courses and pathways and present findings to mathematics instructors and administrators. In particular, conduct research about course taking patterns and the impact of foundational, transition, developmental, and corequisite mathematics courses.

- Collect and analyze disaggregated data about the relationship between students' completion of high school and postsecondary mathematics courses and their pursuit of career and other opportunities.

QUESTIONS FOR FURTHER CONSIDERATION

The engagement strategies, domains of work, recommendations, and essential conditions for implementation provide a roadmap for K-12, higher education, and workforce partners to fundamentally restructure and enhance the quality of mathematics education in other states. State leaders will need to collaboratively create the conditions necessary to promote greater mathematics attainment and achievement and ensure that all students can reach their mathematics potential and succeed across multiple courses and pathways.

We offer several questions for further consideration.

- How can we enhance students' empowerment and agency so that they can make strategic decisions about mathematics courses and pathways?
- How can K-12, higher education, workforce, and other partners balance statewide and systemic priorities with local and regional needs?
- What types of strategies should be implemented to reduce variance among schools and districts related to access to fiscal, staffing, and other types of resources? How can state partners enhance alignment and collaboration across institutions and systems of higher education?
- How can state partners build on and scale strategies that were implemented in response to the Covid-19 pandemic to enhance flexibility and increase access for students?
- How will state entities measure the impact of different courses and pathways on students' college readiness, completion of high school and postsecondary courses, and other outcomes particularly for students of color, students in lower-income communities, and other groups of students?
- How will state partners achieve objectives related to increasing equity and access and create the infrastructure necessary to sustain efforts over time?

CONCLUSION

Our engagement with our state partners has reinforced our belief that reimagining mathematics education by enhancing the content, structure, and sequence of mathematics courses and establishing new pathways will have profound impact on students' academic and career trajectories – especially for African American, Latinx, and Native American students and students in lower-income communities.

When we embarked on the journey to implement the Launch Years initiative, we were eager to work with and learn from our colleagues, and we are grateful for their commitment to the work and their willingness to share their stories, experiences, and expertise; engage in candid conversations about the state of mathematics education; and consider new and exciting possibilities. The robust partnerships that we established will serve as the foundation for future work and we will use the lessons learned to guide ongoing efforts to establish a new paradigm for mathematics education across states.

This brief was written by Dr. Saeyun Lee, Advisor at ESG with the assistance of Ryan Reyna, Principal..

About Launch Years

Launch Years is an initiative led by the Charles A. Dana Center at The University of Texas at Austin - in collaboration with Community College Research Center, Education Strategy Group, and the Association of Public and Land-grant Universities - focused on addressing systemic barriers that prevent students from succeeding in mathematics and progressing to postsecondary and career success. Leveraging work within states, the initiative seeks to modernize math in high school through relevant and rigorous math courses as well as policies and practices leading to more equitable outcomes for all students.

Learn more at: utdanacenter.org/launch-years

1 Charles A. Dana Center, The University of Texas at Austin; Achieve; Community College Research Center, Teachers College, Columbia University; Education Strategy Group; and Association of Public & Land Grant Universities. (2020). *Launch Years: A New Vision for the Transition From High School to Postsecondary Mathematics.* www.launchyearsreport.org/vision; Saeyun Lee and Ryan Reyna. (2019). *Overview of Launch Years Initiative*. Education Strategy Group.

2 Ibid.

3 Lee, S.D. (2021). How three states are implementing high school transition mathematics courses in response to COVID-19: Profiles of Georgia, Texas, and Washington. https://edstrategy.org/resource/how-three-states-are-implementing-high-school-transition-mathematicscourses-in-response-to-covid-19/

4 Ibid.

5 *Launch Years: A New Vision for the Transition From High School to Postsecondary Mathematics*; *Overview of Launch Years Initiative.*

6 Georgia Department of Education. (n.d.) Math and ELA Standards Process. https://gadoe.org/External-Affairs-and-Policy/communications/Pages/Math--ELA-Standards-Process.aspx

7 Ibid.

8 Georgia Department of Education. (n.d.). Mathematics – Georgia Standards of Excellence. https://case.georgiastandards.org/cftree/item/41619