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Adaptation with Integrity:

Origin and Evolution of Accelerating Statway® to a Single Term

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RESEARCH BRIEF

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Melrose Huang, Jon Norman, and Hiroyuki Yamada
Carnegie Foundation for the Advancement of Teaching
Stanford, CA

Key Takeaways

Statway®, an alternative year-long sequence created to help students overcome the challenges of developmental mathematics and achieve college-level statistics credit, has evolved since it was first implemented in 2011. One aspect of that evolution has been the shortening of the two-semester sequence into a single-semester course, providing a further abbreviated path to and through college credit in mathematics. As of the 2016-17 academic year, five institutions have offered an accelerated one-term version of Statway. Naturally, questions arise about the effectiveness of this accelerated Statway design. This report provides reasons that colleges have sought to offer accelerated Statway; the ways in which it has impacted students, instructors, and colleges; and the implementation challenges that they have had to address. Notably, accelerated Statway offers a rich illustration of how colleges have addressed their local needs by making adaptations to the successful Statway program while maintaining the design integrity of the program as it was originally conceived.

Findings indicate that accelerated Statway delivers several key benefits by:

- Producing success rates higher than or on par with those of standard Statway—and well ahead of students pursuing traditional developmental math options;
- Meeting internal demands, particularly as a last-chance opportunity, for students with time constraints who seek to graduate or transfer and have already met all their other graduation requirements;
- Aligning well with other reform initiatives focused on accelerating students through remedial requirements;
- Facilitating an immersive classroom culture that fosters rich group discussions, a sense of community, and an environment that motivates students to persevere. While these benefits are also observed in standard Statway, they are magnified by the intensive nature of accelerated Statway. Faculty credit the intensity of the delivery model with more effectively creating a healthy classroom community.

Accelerated Statway also poses challenges similar to those of co-requisite[1] developmental mathematics models in that:

- Students who register for accelerated Statway may lack awareness of the intensive nature of the course. To ensure that students fully understand the substantial commitment they have to make in order to succeed, effective communication between Statway faculty and academic advisors is key. For instance, instructors can meet with advisors to explain what accelerated Statway entails and suggest that advisors

[1] "In Corequisite Remediation, students enroll directly into college-level courses and receive academic support alongside their regular classes. Rather than facing a long sequence of prerequisite, non-credit courses, students get up to speed while working toward their degree. Additional, mandatory class periods or customized support in a lab provide just-in-time academic support within the college-level course" (Complete College America, 2016). Accelerated Statway combines the remedial and credit-bearing courses within the standard Statway sequence into a single, one-term program of study.

encourage students to take courses with less out-of-class work while enrolled in accelerated Statway.

- Students may struggle to find the necessary time and space to study in order to keep up with the course's rapid content delivery. Offering additional resources, such as peer tutoring programs and weekend study groups, provides students who are falling behind with additional opportunities to learn and practice the application of new material.

Background

Approximately 60% of community college students are required to take at least one developmental math course before being allowed to attempt their first college-level math course. Unfortunately, 80% of these students never successfully complete their math requirements, preventing them from earning a two-year degree, specialized certificates, and/or transferring to a four-year institution (Bailey, Jeong, & Cho, 2010). The Carnegie Foundation for the Advancement of Teaching developed Statway® to help students overcome this obstacle. Statway replaces what was often three (or more) developmental courses that then had to be followed by a college-level course (Yamada & Bryk, 2016). Statway students complete the requirements for developmental and college statistics in a two-course program taught across two consecutive academic terms.

Practitioners launching traditional education reform initiatives are generally encouraged to strive for fidelity of implementation by exactly replicating the program's design within their own settings. Although this framework may be appropriate for simple reforms where compliance is sufficient, Bryk (2016) and LeMahieu (2011) argue that fidelity is not the most suitable goal for complex reforms such as Statway. That is because they require considerable changes to extant organizational culture and/or substantial shifts in participants' prevailing mindsets toward and understanding of their work. Instead of absolute fealty, complex reforms should be implemented with *integrity* with respect to their "empirically-warranted ideas" (LeMahieu, 2011). This is done by being flexible enough in implementation to meet unique institutional conditions while remaining true to the core theories and values undergirding the intervention.

Statway, which is commonly taught as a two-course pathway through which students complete their developmental mathematics requirements and earn credit for college-level statistics, qualifies as a complex reform initiative. The program improves college math success rates across a wide range of institutions and student populations (Hoang, Huang, Sulcer, & Yesilyurt, 2017; Huang & Yamada, 2017; Yamada & Bryk, 2016).

Since its early stages of development, Statway has promulgated innovation through several research-based design principles, three of which center on instructional experience (Carnegie Foundation for the Advancement of Teaching, 2012):

- Through productive struggle, students put forth "effort to make sense of mathematics, to figure something out that is not immediately apparent" while "solving problems that

are within reach and grappling with key mathematical ideas that are comprehendible but not yet well formed" (Hiebert & Grouws, 2007);
- Instruction focused on making explicit connections to concepts allows students to gain a strong conceptual understanding of the content, which also results in improvement of their procedural skills;
- Instead of a series of repetitive practice problems, deliberate practice provides students with structured activities intended to deepen their conceptual understanding, bridge gaps in knowledge, and allow them to apply conceptual knowledge.

Over the course of the Statway initiative, some colleges have come to develop and offer an accelerated (one-term) version of Statway to their students. There are a range of motivations behind and mechanisms for implementing accelerated Statway. However, the variation in how Statway is being offered to students in these accelerated forms does not fundamentally alter any of Statway's design principles (outlined above). Rather, the changes in topics covered, number of class meetings per week, number of hours per class meeting, etc. are primarily driven by institutional context (e.g., colleges may have already established a standard number of contact hours for courses, which they may apply to their accelerated Statway offerings).

Methodology

This report drew on both qualitative and quantitative data describing the reasons why colleges elected to implement a single-term variant, the contexts in which such decisions were made, the processes involved in implementation, and the preliminary outcomes associated with accelerated Statway as an example of local adaptive implementation. In the spirit of practical measurement, we supplemented data from informational interviews with extant data, which were not collected with our research questions in mind but still offered valuable insights into the accelerated Statway program. Specifically, the following sources of data were used:

- Student background characteristics and course outcomes acquired from a combination of institutional research offices, online platforms, and faculty record data were used to calculate student enrollment and success rates[2] for the local accelerated Statway design (see Appendix, Table A1).[3]
- Information on why accelerated Statway was adopted and how it was designed, developed, and implemented was collected through phone interviews conducted with faculty members from each of the five institutions[4] that offered accelerated Statway.[5]

[2] Success was defined as completing Statway with a grade of C (or C- in institutions with a +/- grading system) and higher.

[3] Prior to the 2015-16 academic year, data were produced by institutional research records. Starting in the 2015-16 academic year, student background characteristics were self-reported by students from surveys implemented at the outset of the course via Statway's online platform. Additionally, since the 2015-16 academic year, student course outcomes in Statway have come from faculty-reported grades. For more details, see "Carnegie Math Pathways 2015-2016 Impact Report: A Five-Year Review" (Hoang et al., 2017).

[4] An additional institution offered one section of accelerated Statway in Spring 2015. However, it is no longer active within the Statway NIC and is thus excluded from this analysis. Another institution offered accelerated Statway in Summer 2017, but was excluded from this analysis due to an initial lack of student outcome data. As of

The interviews were augmented by extant data from faculty conference presentations and calls with administrators or faculty leads.

- Information on specific adaptations (e.g., the online modules and topics each respective institution incorporated) made to accelerated Statway curriculum at each institution was collected from both faculty interviews and comparisons of course syllabi (see Appendix, Table A1).
- Descriptive statistics on student body composition and overall enrollment were obtained from individual college fact sheets produced by their respective institutional research offices.

Notes were taken for each faculty interview, and were used to identify common themes or disparities between each college's experiences in developing, adopting, and teaching accelerated Statway.[6]

Among the colleges that adopted accelerated Statway, most have only recently started offering the program and/or have a limited number of participating students and sections. One college (College A in Appendix, Table A1), however, has offered accelerated Statway on a large scale for four academic years as of Spring 2017, and served as the primary case study for this report. An additional four institutions have offered accelerated versions of Statway for shorter periods of time and/or through fewer sections. Data from these schools supplemented data from college A's experience. Together, data from the five institutions provided information illustrating how various schools effectively implemented this adaptation.

Overview of Participating Institutions

As of the 2016-17 academic year, five institutions offer accelerated Statway. These institutions vary in their size, student body composition, geographic location, and the extent to which they are active within the Statway network. As Table A1 (see Appendix) shows, the schools (all two-year degree granting institutions) are located across the United States and range in size from approximately 5,000 to over 15,000 annually enrolled students. Black/African-American and Hispanic/Latino students comprise substantial portions (upwards of ~25%) of each school's population with the exception of College E.

There is variation among colleges in how long they have offered Statway and the number of students who have participated in traditional and accelerated Statway. All institutions maintain the majority of standard Statway course content and course practices, but accelerated offerings

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the 2016-17 academic year, 39 colleges have previously offered Statway and/or currently offer Statway (Huang, 2018).

[5] We interviewed the lead faculty member from each institution with the exception of College B, where we interviewed the lead faculty and an additional instructor. The interviews were semi-structured with a fixed topic, standard set of questions and sequence, as well as the option to formulate follow-up questions via phone or email if needed.

[6] Two Carnegie team members separately conducted faculty interviews, documented those interviews, and produced summary memoranda, which were then used to identify important data points and themes.

differ from the standard version through the addition of longer and/or more frequent meetings, extensive use of tutoring services, and targeted support structures to bolster student attendance and faculty collaboration (see Appendix, Table A1).

Similarities to and Differences from Standard Statway

Aside from reducing the length of the Statway sequence, the majority of colleges offering accelerated Statway have not implemented major changes to Statway's innovative approach. Overall, the precepts of Statway have remained constant across colleges. However, other components of the program—such as contact hours—have been adapted to fit the accelerated structure. The design principles that have been maintained and the less fundamental aspects that have been changed by schools offering accelerated Statway are outlined below.

Maintaining Statway's Innovative Design Principles

Despite adapting the Statway program by developing an intensive one-term course, the colleges that have offered accelerated Statway have not deviated from Statway's guiding design principles. As with standard Statway:

- Accelerated Statway students engage in productive struggle through which they expend effort to arrive at solutions to problems that are not readily apparent but still within grasp;
- The instruction of accelerated Statway remains centered on helping students draw explicit connections to concepts in order to develop a robust conceptual understanding of the material;
- Accelerated Statway materials include structured activities focused on deliberate practice, thereby strengthening students' understanding and providing them with ample opportunities to apply their learnings.

Adapting the Statway Program

Despite having upheld the design principles underpinning standard Statway, some institutions experimented with modifying the number of modules taught and the number of classroom contact hours to accommodate the faster delivery of accelerated Statway and differences in local transfer requirements.

College A stood out as the institution that made the most modifications to the Statway curriculum by dropping some learning objectives (i.e., Modules 4, 7-8, 10)[7] so that accelerated Statway could mirror the content of its traditional statistics course and better comply with local transfer institution requirements. Items that corresponded to these excluded topics were

[7] The topics covered by each of the Statway modules are as follows: Module 1 - Types of Statistical studies and Producing Data; Module 2 - Summarizing Data Graphically and Numerically; Module 3 - Examining Relationships: Quantitative Data; Module 4 - Non-Linear Models; Module 5 - Relationships in Categorical Data with Intro to Probability; Module 6 - Probability and Probability Distributions; Module 7 - Inference for One Proportion; Module 8 - Inference for Two Proportions; Module 9 – Inference for Means; Module 10 - Chi-Square Tests; Module 11 - Mathematical Models.

removed from the mid-Pathway and summative assessments, and instructors had the option of including a few new items from the Statway assessment item bank to better assess the remaining topics. At College E, the accelerated Statway curriculum excluded Module 11 (Mathematical Models). Both College C and College E excluded any lessons marked as "optional" from accelerated Statway. Faculty at Colleges B and D stated that there were no differences between the curricula for standard Statway and accelerated Statway. For both formats, instructors at College B dropped Modules 10 (Chi-Square Tests) and 11 (Mathematical Models). Instructors at College D excluded "optional" lessons for both Statway formats.

To deliver virtually the same amount of content (other than the exceptions noted above) in half the time as standard Statway, the number of contact hours for accelerated Statway ranged from 6 to 12 hours per week. In contrast, standard Statway students were generally in class 4 hours each week.[8] As with accelerated Statway, some colleges that only implemented standard Statway also removed modules from the curriculum. For instance, at one such institution on the West Coast, the topic of chi-square tests was only covered if class time permitted.

Reasons for Adopting Accelerated Statway

Colleges deployed accelerated Statway's single-term structure in anticipation of a number of expected benefits. Overall, colleges adopted accelerated Statway with students in mind as the primary beneficiaries. In several instances, external state or system education policies created incentives for colleges to reduce student out-of-pocket costs and/or decrease time to degree completion. In other cases, colleges leveraged internal changes in related programs (e.g., they were more responsive to locally-identified challenges faced by students or integrated with ongoing developments led by colleges implementing intensive out-of-classroom supports).

Reducing Student Attrition

Colleges recognized that adopting accelerated Statway had the potential to reduce the opportunity for students to drop out of the program. Since traditional Statway was designed as a two-course sequence to be taken consecutively by the same cohort of students, there was the chance that students who were successful in the first term might, for a variety of reasons, have decided not to enroll in the second term. Across the NIC, attrition between the first and second courses within the standard Statway sequence has persisted as an impediment to student success, accounting for 36% of all students who did not complete the sequence in the 2016-17 academic year (Huang, 2018).

At College A, for example, the structure of the academic schedule increased the likelihood of this possibility. College A's academic year was split into four terms: a 12-week fall term followed by a shorter 6-week fall term and, successively, a 12-week spring term followed by a shorter 6-week spring term. Students did not always take courses in both the longer 12-week terms and the shorter 6-week ones, and often opted to take the shorter terms off in order to

[8] The median number of weekly contact hours was 3.67 for standard Statway students from the 2011-2017 academic years, and was derived from 338 courses with both class length and class frequency data.

focus on work and/or family obligations. One faculty member reported that adapting standard Statway to College A's unique term structure would have created a 6-week hiatus between the first and second courses within the sequence, making it difficult to keep the same cohort of students together.

In the same vein, faculty and administrators at College B observed that when Statway was taught as two standalone courses, students would not always enroll in the second part of the program, even if they had succeeded in the first. Faculty members from both College B and College E stated that teaching accelerated Statway removed the exit point between the first and second terms in standard Statway and thus had the potential to increase student retention rates.

Alignment with Local Efforts to Accelerate Remedial Coursework

At some institutions, accelerated Statway was consistent with the goals of extant programs that aimed to reduce the amount of time students spent completing remedial coursework. For instance, College A was part of a system-wide program providing comprehensive (including financial and social) supports for students to earn their degree or transfer in a timely manner. Adopting accelerated Statway addressed its goals of reducing student costs and advancing progress toward degree completion by shortening the length of the developmental math sequence. At College B, instructors collaborated with administrators of an extant program aimed at helping male students of color complete their developmental requirements over the summer term. As part of this program, a section of accelerated Statway was offered exclusively to men of color, in which 10 of 16 enrolled students passed.

Meeting Internal Demand

Some colleges also gravitated toward accelerated Statway due to interest from faculty, administrators, advisors, and/or students. In College B, a faculty member who had seen other types of intensive courses prove successful decided to advocate for accelerated Statway as a similar type of course for developmental math students. This instructor's enthusiasm was bolstered by demand from students and advisors of students who only needed to earn college-level math credit in order to graduate. College C also began offering accelerated Statway because faculty felt there was substantial demand for it, particularly among students who were enrolled in their final academic year or semester but had not yet completed all of their math requirements. Their theory was corroborated when they investigated administrative data and discovered that there were roughly 4,000 students who fell into this category.

Observed Benefits of Accelerated Statway

After colleges implemented accelerated Statway, its anticipated benefits manifested in both faculty observations and student outcomes. These program advantages were further enhanced by unexpected benefits such as facilitating a stronger sense of classroom belonging.

Accelerated Statway Outcomes

Despite the diverse range of conditions under which it was taught, accelerated Statway achieved largely positive results in terms of reducing student attrition and helping students complete their remedial requirements in a timely manner. As Table A1 (Appendix) shows, all colleges that have implemented both forms of Statway have achieved higher success rates in accelerated Statway than standard Statway.[9] At College B, where both accelerated Statway and standard Statway have been implemented across multiple years, the success rate for accelerated Statway was 85% whereas the success rate for standard Statway was 59%. College C demonstrated similarly positive results with success rates of 92% for accelerated Statway compared to 75% for standard Statway. Although College D only offered limited sections of accelerated Statway, it achieved an 83% success rate for accelerated Statway and a 39% success rate for standard Statway. At College A, where the most students took accelerated Statway but standard Statway was never offered, the success rate among accelerated Statway students was 60%. The success rate for College E, which also only offered accelerated Statway, was 77%. Across the NIC, 67% of accelerated Statway students successfully achieved college math credit within one term, whereas 50% of standard Statway students successfully achieved college math credit within a one-year time frame.[10] Importantly, success rates for both accelerated and standard Statway were substantially higher than the one-year success rate of 6% among traditional remedial math students[11], which suggested that accelerated Statway further advanced what was already an improvement upon the status quo (Hoang et al., 2017).

Growing Internal Demand

As faculty and administrators predicted, accelerated Statway's appeal remained evident as students continued to register for the course. Interest in the program had even grown over time at some institutions, which allowed them to implement the program at scale and guide more students through the developmental math sequence. For instance, faculty and

[9] These preliminary findings are based on descriptive success rates. Given the relatively limited amount of accelerated Statway sections that have been offered, it is possible that high success rates may have been influenced by confounding factors such as faculty effects or student characteristics. Accordingly, more rigorous analytic techniques may be used in the future in order to establish a causal relationship between accelerated Statway and enhanced student success.

[10] Results used data from varying periods of time from Fall 2011 to Spring 2017 (see Footnotes 13 and 14). Year 6 (Fall 2016 to Spring 2017) success rates incorporated into overall results were calculated using data as of September 25, 2017 and may be subject to minor changes due to partially incomplete data submission from institutions.

[11] To compute this baseline success rate, the Pathways team worked with institutional researchers from 18 Statway colleges in Year 1 (2011-12) to collect data on developmental mathematics course-taking prior to Statway implementation. Analyses revealed that only 5.9% of non-Statway developmental math students enrolled at these colleges in 2008 received credit for college-level mathematics in one year.

administrators from College B noticed that once students were made aware of the option to take accelerated Statway, demand for it far exceeded that for its standard counterpart, especially among students and advisors of students who only needed to complete college-level math in order to graduate. These observations were reflected in administrative enrollment data: in general, more students enrolled in accelerated sections. In fact, demand for standard Statway became so low that in the 2015-16 school year at College B, only four students registered for it, after which College B transitioned to offering only accelerated Statway.

Fostering an Increased Sense of Community within the Classroom

Beyond the benefits described above, faculty observed that the intensive nature of accelerated Statway was beneficial to classroom culture. At College B, accelerated Statway was taught within an 11-week quarter during which students met for class five days a week. Because the course was worth 6.7 credit hours and campus policy defined a full course load as 8 credit hours[12], most students opted to take only one other course, such as a physical education elective, while enrolled in accelerated Statway. Faculty expressed the belief that the community-building aspect embedded in standard Statway was heightened through accelerated Statway's intensive format. As one instructor reported, students "feel like they are part of a family because they see each other so often" during class, in study groups, etc.

Strategies to Address Challenges of Accelerated Statway

While colleges exhibited high success rates with accelerated Statway, they also faced challenges. Because accelerated Statway essentially delivered the same amount of content in half the time as standard Statway, all institutions reported difficulties associated with students struggling to keep up with the time- and effort-related demands of the course. However, these challenges were not unique to accelerated Statway in that students enrolled in, for instance, co-requisite math courses faced similar difficulties in balancing their personal schedule against the increased commitment of an intensive developmental course (Smith, 2017). The ways in which each college responded to obstacles varied widely based on institutional context. At some colleges, for instance, there was only one accelerated Statway section and therefore only one accelerated Statway instructor in a given term. These faculty had to craft student supports and interventions by observing areas of concern within their own classroom. At other institutions, faculty had access to wider support systems and had found ways to collaboratively improve student experiences and outcomes with other accelerated Statway instructors, campus programs, and/or external organizations.

Lack of Student Awareness of Level of Commitment

Not all students who registered for the course were aware that accelerated Statway condensed the content of standard Statway into half the time and thus required a higher level of commitment than the average community college course. Faculty and administrators at several colleges dealt with this issue by encouraging students not to take too heavy a course load while

[12] College B runs on a quarter system. These values have accordingly been converted from quarter to semester credit hours.

enrolled in accelerated Statway. An instructor from College C found that most students were able to keep up with the rapid pace of the class because accelerated Statway was the only substantive course in which they were enrolled during the semester. Faculty at College D worked closely with academic counselors to explain the impetus for offering accelerated Statway, as well as the heavy commitment that students had to make in order to succeed. Counselors were asked to discourage students from overburdening themselves by registering for too many courses.

Regular Class Meetings Insufficient for Student Understanding

After developing inaccurate perceptions of the program, some accelerated Statway students struggled to find opportunities to study and keep abreast of course content. In response, several faculty members at different colleges encouraged students to attend tutoring sessions or additional study opportunities outside of regular class meetings.

For example, instructors at College A collaboratively developed a peer-tutoring program that hired students who had previously completed Statway or traditional statistics with high grades to work with current Statway students. The tutoring program at College A was comprehensive. Tutors not only observed classes to gain familiarity with the curriculum and classroom environment, but also completed a 2-3 hour training session on what Statway entailed (i.e., information on Productive Persistence, group dynamics, etc.). Tutors surveyed students at the beginning of the academic term to determine session scheduling, and provided a minimum of three hours of weekly tutoring to students, who attended sessions on a voluntary basis. Attendance and grade data collected by tutors and instructors suggested that students who succeeded in accelerated Statway were more likely to have attended a higher number of tutoring sessions compared to those who did not succeed in the course. These data also suggested that lower-performing students (i.e., those with low GPAs) appeared to show the most improvement when they attended tutoring sessions, but also tended to face more scheduling difficulties. To better help these students, in particular, faculty members worked on supplying more tutors by collaborating with other extant tutoring programs on campus.

Similar peer tutoring programs leveraging the expertise of former Statway students existed at Colleges B, D, and E, and all colleges had a drop-in tutoring center available on campus. At College D, one instructor took extra steps to support her students by encouraging staff at the campus tutoring center to set up study groups for Statway students, as well as hosting regular weekend sessions for students to study together prior to assessments. Faculty at College A also made efforts to improve the quality and efficiency of regular class meetings by creating a shared repository of classroom and computer lab materials.

Conclusion

Institutions offered accelerated Statway for a variety of external and internal reasons. Unique institutional conditions also presented colleges with a number of challenges in successfully implementing accelerated Statway. Each institution addressed these barriers to success by developing solutions tailored to their specific context while maintaining the design principles central to the standard form of Statway.

Available data suggest that accelerated Statway delivered on the hypothesized benefits for the colleges that implemented the program. Consistent with their theory of improvement, faculty members found that accelerated Statway:

- Produced success rates higher than or on par with those of standard Statway—and well ahead of students pursuing traditional developmental math options;
- Met internal demands, particularly as a "last chance" opportunity for students seeking to graduate or transfer soon who had already met their other graduation requirements. In response to increased student demand over time, accelerated Statway also transitioned from being piloted to being offered at scale;
- Aligned well with other reform initiatives focused on accelerating students through all remediation requirements.

Additionally, faculty discovered some unexpected benefits to accelerated Statway. Notably, the program facilitated:

- An immersive classroom culture that fostered rich group discussions, a sense of community, and, therefore, academic persistence. While these benefits were also observed in standard Statway, they were magnified by the even more intensive nature of accelerated Statway. Faculty credited the more intense delivery model with being more effective for creating a healthy classroom community.

Given the rigor and demand of the coursework, it could be beneficial for institutions that are considering adopting accelerated Statway to review the following methods that have been used to help accelerated Statway students commit to the time and energy demands of the program:

- Students who registered for accelerated Statway often lacked awareness of the intensive nature of the course. To ensure that students were well informed about the substantial commitment they had to make in order to succeed, effective communication between Statway faculty and academic advisors was key. For instance, instructors met with advisors to explain what accelerated Statway entails and suggest that advisors encourage students to take courses with less out-of-class work while enrolled in the program.
- Students struggled to find the necessary time and space to study in order to keep up with the course's rapid content delivery. Offering additional resources such as peer tutoring programs and weekend study groups helped students who were falling behind to learn and practice new material.

As the program continues to expand to more institutions, future directions for research should include conducting more rigorous assessments on the efficacy of accelerated Statway. For instance, with sufficient data, multilevel propensity score matching can be used to directly compare the outcomes of accelerated Statway students against similar peers in standard Statway or traditional developmental math programs, and to disentangle faculty and institutional effects on student success.[13] Tracking students' distal outcomes (i.e., degree/certificate completion and/or transfer to four-year institutions) after exposure to accelerated Statway can also be useful for evaluating the program's long-term effects and potential benefits.[14] The findings in this report provide a context for understanding how and why accelerated Statway has been implemented, as well as preliminary descriptive outcomes, and can be a stepping stone to future investigations.

Notably, the co-requisite model is gaining national momentum in the developmental education reform movement (Bracco, Austin, Bugler, & Finkelstein, 2015). Our report suggests that accelerated Statway shares features and challenges with the popular co-requisite models, including the common goal of simplifying the traditional developmental sequence in order to improve student outcomes, as well as potential challenges students face in balancing their other commitments against those of intensive, accelerated content delivery. However, the productive persistence interventions embedded within the Statway program differentiate accelerated Statway from most co-requisite courses, which generally do not explicitly address non-cognitive barriers that many of their students face (Bailey & Jaggars, 2016; Smith, 2017). With development of a Statway co-requisite course currently underway, comparative studies further illuminating the strengths and challenges of accelerated Statway and traditional co-requisite models have the potential to help inform the design of adaptations.

Overall, accelerated Statway appears to exhibit results comparable to or better than those of standard Statway, which is promising given the latter program's evidence-based effectiveness as a viable alternative to traditional remedial math programs. Depending on institutional conditions, accelerated Statway is likely to present an improvement upon the original program by more efficiently supporting students to earn college-level math credit. Further, institutions manage to strike a balance between customizing aspects of accelerated Statway with respect to their local needs while upholding the essence of the original Statway program as it is expressed in its longstanding, research-based design principles, thereby establishing a successful approach to implementing complex education reforms with integrity.

[13] For similar analyses that use propensity score matching to assess the effectiveness of the Statway initiative as a whole and to examine variation in performance across institutions and instructors, see "Maintaining Success Rates: Does Statway sustain its impact as it scales to new classrooms and institutions?" (Huang & Yamada, 2017), which leveraged methods embodying an extended application of "Assessing the First Two Years' Effectiveness of Statway: A multilevel model with propensity score matching" (Yamada & Bryk, 2016).

[14] For a similar analysis that assesses long-term student outcomes of standard Statway, see "Pathways Post-Participation Outcomes: Preliminary Findings" (Norman, 2017).

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Appendix

Table A1. ***Institutional Characteristics and Performance***

	College A	**College B**	**College C**	**College D**	**College E**
General Information					
Location	East Coast	West Coast	West Coast	Midwest	Midwest
Size	Large (>15,000 students)	Mid-sized (5,000-15,000 students)	Large (>15,000 students)	Mid-sized (5,000-15,000 students)	Mid-sized (5,000-15,000 students)
Institution type	2-year college	2-year college	2-year college	2-year college	2-year college
Sex	57% Female 43% Male	60% Female 40% Male	50% Female 48% Male 2% Unknown	55% Female 43% Male 2% Unknown	50% Female 50% Male <1% Unknown
Race/Ethnicity	43% Hispanic 19% Black 21% Asian 13% White 4% Other	10% Hispanic 13% Black 13% Asian 59% White 5% Other	24% Hispanic 5% Black 16% Asian 38% White 17% Other	10% Hispanic 31% Black 6% Asian 39% White 14% Other	<1% Hispanic 2% Black 4% Asian 84% White 10% Other
Statway NIC Membership	Active	Active	Active	Active	Active
Offer(ed/s) Standard Statway	N/A	Fall 2011-Spring 2015	2013-Present	Fall 2013-Present	N/A
Offer(ed/s) Accelerated Statway	Fall 2013-Present	Spring 2012-Present	Spring 2016-Present	Fall 2016-Present	Fall 2016-Present
Enrollment in standard Statway	N/A	>300 students	<400 students	>300 students	N/A
Enrollment in accelerated Statway	<2,000 students	>400 students	>60 students	<30 students	<300 students
Standard Statway success rate[15]	N/A	59% (n = 99)	75% (n = 351)	39% (n = 195)	N/A

[15] Standard Statway success rates were calculated using data from Fall 2011 to Spring 2015 for College B, from Fall 2013 to Spring 2017 for College C and College D. Data were unavailable for College A and College E because they have never offered standard Statway.

	College A	**College B**	**College C**	**College D**	**College E**
Accelerated Statway success rate[16]	60% (n = 1994)	85% (n = 382)	92% (n = 63)	83% (n = 23)	77% (n = 270)
Accelerated Statway Implementation					
Hours and credits	2-3 hours 2-3 days per week, depending on the section (for a total of 7 hours [5 faculty hours and 2 computer lab hours] per week) 12-week semester 3 credit hours	1 hour and 50 minutes 5 days per week 11-week quarter 6.7 credit hours	3 hours 4 days per week 16-week semester 8 credit hours	2 hours and 5 minutes 4 days per week 16-week semester 9 credit hours	2 hours 3 days per week 16-week semester 4 credit hours for students intending to transfer 3 credit hours for students intending to enter workforce after completing A.A/certification
Course transfer equivalent	Introductory level statistics course	Introductory level statistics course	Introductory level statistics course	Introductory level statistics course	Introductory level statistics course
Module order	1, 2, 11, 3, 5, 6, 9	1, 2, 3, 4, 5, 6, 7, 8, 9	1, 2, 3, 4, 5, 6, 7, 8, 9, 10	1, 2, 3, 4, 5, 6, 7, 8, 9, 10	1, 2, 3, 4, 5, 6, 7, 8, 9, 10

[16] Accelerated Statway success rates were calculated using data from Fall 2013 to Spring 2017 for College A and College B, from Fall 2015 to Spring 2017 for College C, and from Fall 2016 to Spring 2017 for College D and College E.

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Carnegie Foundation for the Advancement of Teaching
51 Vista Lane
Stanford, California 94305
650-566-5100

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