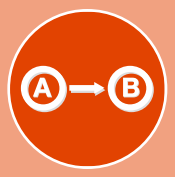

Making an Impact

November 2016

Scaling academic planning in community college: A randomized controlled trial

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Key findings

Community college students often lack an academic plan to guide their choice of coursework and achieve their education goals, in part because counseling departments typically lack the capacity to advise all students. This randomized controlled trial tested the impact of guaranteed access to either a group workshop or a one-on-one academic counseling session to help students prepare an academic plan, along with reminders to attend the sessions. Both interventions increased academic plan completion rates by more than 20 percentage points over completion rates for a control group that received neither guaranteed access to a counseling session nor ongoing electronic "nudges" to attend. Exploratory evidence suggests that workshop counseling is as effective as one-on-one counseling in getting students to complete the academic planning process. Workshop counseling was the most cost-effective counseling option based on completion rates of academic plans.

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Summary

Getting more college students to prepare a semester-by-semester academic plan is widely considered a promising strategy for improving persistently low completion rates at community colleges (Scott-Clayton, 2011). Nationwide, only about 35 percent of students who enroll in community college earn a credential within six years (Radford, Berkner, Wheeless, & Shepherd, 2010). In California only one in four students enrolled in community college earns a credential or transfers to a four-year college within six years of first enrolling (Moore, Shulock, Ceja, & Lang, 2007). Statistics such as these prompted the California State Legislature, with the strong support of the Chancellor's Office of the California Community Colleges, to pass the Student Success Act in 2012. The act mandates that all community college students complete an academic plan early in their college career, but provides no guidance to colleges on how to operationalize the mandate. The challenges of doing so are formidable. Given that the median national community college ratio of students to counselors is 441 to 1 (Robbins, 2013), most counseling departments lack enough counselors to work with each student individually to develop a plan. Usually, only the more motivated students endure the long waits to see a counselor (Scott-Clayton, 2011; Venezia, Bracco, & Nodine, 2010).

To overcome these challenges, the South Orange County Community College District developed a technology-based approach to bring academic planning to scale while ensuring that all plans receive counselor input. For years students have had access to an online academic planning tool called My Academic Plan (MAP), which was designed and developed by the district. In collaboration with Regional Educational Laboratory West, the district used the MAP tool to test an intervention that guaranteed access to one of two types of counseling sessions (group workshops or one-on-one counseling), combined with targeted "nudging" to encourage students to attend the counseling session and complete an academic plan—that is, submitting a counselor-approved academic plan created using the MAP tool. Nudges were delivered through Sherpa, the district's web-based platform that disseminates information to students on college courses, deadlines, academic programs, and other support to help them navigate college. The district also developed an integrated data system to coordinate MAP, Sherpa, and SARS, the scheduling software program, which together constitute the MAP system.

This report presents the results of a randomized controlled trial that tested whether guaranteeing access to either a group counseling workshop with standardized content or a regular one-on-one counseling session, combined with nudging to get students to attend the session, increases the likelihood that students would complete an academic plan compared with students in a control group that received no guaranteed access to counseling and no personalized electronic reminders. The study also tested the extent to which students assigned to either intervention group are more or less likely than students in the control group to schedule and attend a counseling session and register for coursework the following semester.

In September 2014, 1,763 first-time students at Saddleback College were randomly assigned to one of three groups: 1,085 students were assigned to the workshop group, 193 students to the one-on-one counseling group, and 485 students to the control group. Students in the control group received neither the guaranteed access to counseling nor the ongoing nudging. Instead, those students could seek help in completing a plan by scheduling a

counseling appointment or waiting in line for an appointment like any other Saddleback student. The study yielded four key findings:

- The enhanced MAP system was implemented as intended by the South Orange County Community College District and Saddleback College. Most notably, the nudges were successfully delivered, and the counseling workshops were conducted according to the schedule and plan.
- Both the workshop and one-on-one counseling interventions increased the percentage of students who scheduled and attended counseling appointments and who completed an academic plan by more than 20 percentage points compared with the control group.
- Neither the workshop nor the one-on-one counseling interventions appeared to affect student enrollment in the following semester.
- Exploratory evidence suggests that the workshop intervention, with nudges, was less costly and performed as well as the one-on-one counseling intervention, as measured by the percentage of students who successfully scheduled and attended counseling appointments and completed an academic plan.

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Why this study?

Nationwide, only about 35 percent of students who enroll in community college complete a certificate, associate's degree, or bachelor's degree from any institution within six years (Radford et al., 2010). In California only one in four students enrolled in community college earns a credential or transfers to a four-year college within six years of first enrolling (Moore et al., 2007). Statistics such as these prompted the California State Legislature, with the strong support of the Chancellor's Office of the California Community Colleges, to pass the Student Success Act in 2012 (SB 1456). The act requires all first-time community college students, starting with the fall 2014 cohort, to take a placement test to assess their readiness for college-level courses, to receive orientation, and to prepare a semester-by-semester academic plan listing their education goals, major, and courses needed to fulfill their major requirements. While the act mandated that all community college students have a comprehensive academic plan, it provides no guidance to colleges or how to operationalize the mandate.

Intuitively, having an academic plan early in one's college career makes sense. If students make informed decisions about their career goals, their major, and the courses necessary to satisfy the requirements for their major, they should be more likely to make steadier progress toward achieving their goals

Academic planning is widely considered to be a promising strategy for improving persistently low completion rates at community colleges (Scott-Clayton, 2011). Intuitively, having an academic plan early in one's college career makes sense. If students make informed decisions about their career goals, their major, and the courses necessary to satisfy the requirements for their major, they should be more likely to make steadier progress toward achieving their goals. Students consistently agree with this idea when surveyed (Booth et al., 2013; Center for Community College Student Engagement, 2012; Matus-Grossman, Gooden, Wavelet, Diaz, & Seupersad, 2002).

At the time that the Student Success Act was passed, most California community colleges required students to take placement tests and attend orientation programs but did not require students to complete an academic plan. Some colleges encouraged academic planning, especially through special classes or programs, but participation was low. The act required that, as of fall 2015, all students submit an academic plan before earning 15 semester units or before completing their third semester. Students who did not submit an academic plan are barred from registering for classes the following semester. Given many colleges' severely limited counseling capacity, colleges were concerned about their ability to work with hundreds or even thousands of students each semester to prepare an academic plan.

The South Orange County Community College District was motivated by the mandate of the Student Success Act to advance its longstanding goal to scale academic planning. Home to two community colleges serving nearly 40,000 students, the district was well positioned to advance an academic planning agenda (see appendix A for more information about the district and its student population). Several years earlier the district's information technology department had created two technology-based planning tools: an online academic planning tool called My Academic Plan (MAP) and a recommendation and personalization engine designed to enhance student success called Sherpa. The district had been using Sherpa for years to "nudge" students via email messages, text messages, notices on students' MySite web portals, and robocalls to meet campus deadlines and take advantage of campus services. As the district began planning to use Sherpa to guide more students through the MAP process, the counseling departments at the district's two community colleges (Irvine Valley and Saddleback) were in the process of determining how to deal with potentially thousands of students seeking guidance for and approval of their

plans. The counseling department also decided to require that every student's academic plan be reviewed and approved by a counselor, a requirement that goes beyond those outlined in the Student Success Act.

The operational challenges of providing all students with an approved academic plan, based on one-on-one guidance from a counselor—the traditional approach to helping students create an academic plan—are formidable, given the national median community college ratio of students to counselors of 441 to 1 (Robbins, 2013). Because access to counselors is limited, usually only the more motivated students endure the long waits to see a counselor (Scott-Clayton, 2011; Venezia, Bracco, & Nodine, 2010). The South Orange County Community College District knew that its system to equip students with a counselor-approved academic plan was not adequate for satisfying the act's mandates. For example, in fall 2012 less than 10 percent of students opened the district's MAP tool.

The operational challenges of providing all students with an approved academic plan, based on one-on-one guidance from a counselor—the traditional approach to helping students create an academic plan—are formidable, given the national median community college ratio of students to counselors of 441 to 1

Prompted by the 2012 act to learn more about what it would take to increase the percentage of students who completed an academic plan, the district collaborated with the California Community College Alliance at Regional Educational Laboratory (REL) West to launch an experiment in fall 2014. The effort began one year before registration bars were scheduled to go into effect for students in the fall 2014 cohort of new students who did not submit a counselor-approved academic plan. The district believed that the best way to achieve this goal was to run counselor-led group sessions, rather than require students to schedule an appointment or wait in line for a one-on-one counselor meeting. Together, the district and one of its colleges, Saddleback College, devised an intervention, referred to in this report as the "MAP system," to increase the percentage of students with a completed academic plan (see box 1 for a detailed description of the system's four key components).

Box 1. The four components of the My Academic Plan system

A completed academic plan is one created using the MAP tool that has been reviewed and approved by a counselor. The academic plan lists the courses a student plans to take, semester by semester, including those needed to satisfy the requirements of a major and to attain the student's goals (for example, an associate's degree or transfer to another college), as well as any needed developmental education classes, general education courses, and electives.

For this study of the MAP system, students were randomly assigned to three groups: two intervention groups, with "nudging" and guaranteed group or individual counselling, and one control group, which received neither nudges nor guaranteed access to counseling.

1. ***Targeted nudging.*** Students randomly assigned to an intervention group received targeted and personalized "nudging" (designed by college staff with help from the study team) through emails, text messages, notices on students' MySite web portals, and robocalls, to urge them to start and complete the MAP process (see table A1 in appendix A). These nudges were delivered by Sherpa, a recommendation and personalization engine.
2. ***Guaranteed counseling services.*** Intervention group students were offered a guaranteed counseling appointment, held for up to two weeks following each nudge, either in a two-hour group counseling workshop, which followed a counselor-designed curriculum, or in a one-on-one counseling session conducted as a regular counseling session. Guaranteed counseling was organized to maximize the number of intervention group students who would take advantage of it and make an appointment, while not negatively affecting

(continued)

Box 1. The four components of the My Academic Plan system *(continued)*

access to counselors by control group students and students not in the study. To ensure that the study did not lengthen student wait times to make appointments and see a counselor, the college's counseling department implemented a number of strategies, including making greater use of adjunct counseling faculty who also work as part-time counselors.

3. ***Access to an online academic planning tool.*** All students (in intervention and control groups as well as those who were not in the study) had access to the MAP tool. The tool guides students through an online process to select courses needed to satisfy their major and meet their education goals. The tool is linked to online resources including course catalogs, requirements for transfer to four-year institutions, and other useful information to help students and their counselors construct a comprehensive, semester-by-semester plan. The tool has been available to all students at the college for several years and was made available to the control group as well as to the two intervention groups.
4. ***Integrated data system.*** An integrated data system, developed by the South Orange County Community College District and Saddleback College, was used to coordinate nudges, track student responses, schedule workshops and one-on-one sessions, and track attendance and academic plan completion. The system incorporated MAP, Sherpa, and SARS, a scheduling software that was adapted for the MAP system (see figure D1 in appendix D for more details about the system). This system was developed specifically for the intervention.

What the study examined

An academic plan was considered completed if it was created using the MAP tool and was reviewed and approved by a counselor

The study used a randomized controlled trial to assess how two interventions affected completion rates for student academic plans. An academic plan was considered completed if it was created using the MAP tool and was reviewed and approved by a counselor.

All eligible students (those who were reported as new to the district and who had not yet completed an academic plan) in the freshman cohort of fall 2014 at Saddleback College were randomly assigned to one of three study groups: one of two intervention groups or a control group (see box 2 for an overview of the study data and random assignment of students and appendixes A, B, and C for a detailed discussion of the study methods and data). Both intervention groups received guaranteed access to a counselor and a set of personalized nudges over the course of the semester to encourage them to take advantage of the counseling guarantee and complete an academic plan. Students in the intervention groups were randomly assigned to either the workshop group or the one-on-one group. The control group received only an initial nudge, an email in which the student was encouraged to make an appointment or walk in to see a counselor to complete an academic plan (table 1). This represented business as usual at the college.

The study assessed whether nudging students to attend and guaranteeing them access to either a counseling workshop or a one-on-one counseling session increased academic plan completion rates compared with business as usual (control group). Students in the control group, like other Saddleback students, received only one nudge email and were not guaranteed a counseling session. The study also compared rates of students making and keeping counseling appointments and registering for classes the following semester for the intervention and control groups.

Box 2. Data sources and study sample

Data sources

To assess fidelity of implementation, the study relied mostly on qualitative data, gathered in focus groups and interviews, to measure how the My Academic Plan (MAP) system was implemented and to capture the different perceptions and attitudes of students, counselors, and college administrators. The implementation study also took advantage of the college's student survey, which students (including a small number of nonstudy participants) completed before leaving the counseling workshops. To estimate impacts on the outcomes studied, the study relied on data obtained from college administrative records, including demographic and enrollment data, attendance in workshops and one-on-one counseling sessions, and academic plan completion data. The cost and cost-effectiveness analyses used financial data from Saddleback College. (For a more detailed description of qualitative data collection methods and data used to measure outcomes, see appendix B.)

Study sample

Random assignment ensures that the characteristics of students in each of the three research groups are unlikely to be different at the start of the study. By comparing the behavior of students who received customized nudges with the behavior of students who did not, and by comparing academic plan completion rates of students who were assigned to each of the three study groups, it is possible to determine whether the intervention caused the observed differences in outcomes among groups.

A random sample was selected in the third week of September 2014, a few weeks after classes had begun. All students who met the eligibility criteria (including being a first-time student at Saddleback and not having previously completed an academic plan) were automatically enrolled in the study but were given an opportunity to opt out prior to random assignment (see appendix A for a discussion of the eligibility criteria). After accounting for students who opted out of the study and for ineligible students, the analysis sample included 1,763 students: 1,085 students were randomly assigned to the workshop group, 193 students to the one-on-one group, and 485 students to the control group. The numbers of students assigned to the workshop and one-on-one groups were informed by two factors: the capacity of the college's counseling department to dedicate counselors to delivering MAP services, and requirements in the research design to enable detection of statistically significant differences between the intervention groups and the control group. (See appendix B for a detailed explanation of how statistical power was calculated.) The college decided that offering 6 group sessions and 20 one-on-one sessions per week for 10 weeks was optimal, given the number of counselors available. These parameters determined the maximum number of students who were assigned to these two study groups, with the remainder assigned to the control group.

Random assignment resulted in three study groups that look similar in gender, age, race, ethnicity, reasons for attending college, and prior education level completed (see tables C1 and C2 in appendix C). Under randomization, it is expected that around 5 percent of all comparisons of baseline characteristics are statistically significant at the $p < .05$ level ($.05 * 78 = 4$). Therefore, observing 4 or 5 statistically significant differences is neither unusual nor cause for concern. Characteristics of the students in the sample generally reflect those of students in the college as a whole (see table A1 in appendix A), and there were few statistically significant differences among students randomly assigned to the three groups. This means that any postintervention differences in the outcomes are likely due to the intervention itself.

(continued)

Box 2. Data sources and study sample *(continued)*

A small number of students assigned to one study group ended up working on their academic plans as part of another study group. The analysis in this report is an intent-to-treat analysis, so these students' outcomes were analyzed as part of the group to which they were assigned rather than the group in which they participated. Ten control group students accessed a workshop during the study and two completed an academic plan as part of a course. One control group student accessed the one-on-one counseling session designated for the one-on-one group students.

Table 1. My Academic Plan intervention components and how they vary by study group, 2014/15

	Workshop group	One on one group	Control group
Targeted nudging	Initial nudge and up to 10 additional nudges, ceasing after student has completed the My Academic Plan (MAP) process	Initial nudge and up to 10 additional nudges, ceasing after student has made an appointment and completed the MAP process	Initial email nudge only
Guaranteed access to counseling services	Guaranteed appointments can be made for reserved slots within a two-week period through a link sent via email or phone call; workshop curriculum walks students through the process of completing an academic plan; held in computer lab, two hours long, one to two counselors present, capped at 19 students	Guaranteed appointments can be made for reserved slots within a two-week period through a link sent via email or phone call; one-on-one session with counselor; about one hour long	Not guaranteed; students can make an appointment for the following week or walk in; one-on-one session with counselor; a small number of students can receive MAP counseling as part of a college course

Source: Authors' compilation.

Whether students assigned to the workshop group completed academic plans at the same rate as students assigned to the one-on-one group was also explored. Although the answer to this question is important to the district, the study was not powered to definitively determine whether group counseling was as effective as one-on-one counseling. Thus, this evidence should be interpreted as exploratory rather than confirmatory. (Appendix B gives a more detailed explanation of the difference between confirmatory and exploratory analyses.)

The study assessed whether nudging students to attend and guaranteeing them access to either a counseling workshop or a one-on-one counseling session increased academic plan completion rates compared with business as usual

Finally, the study compared the costs of the three groups in terms of student attendance in counseling sessions and academic plans completed.

The study was designed to answer questions about whether the MAP system increased the number of students who started and completed the MAP process. It also looked at how the system was implemented, how counselors and students reacted to it, and the relative cost-effectiveness of the two interventions and the control condition.

Implementation questions:

- Was the intervention implemented as intended by the South Orange County Community College District and Saddleback College?
- How did college administrators, counselors, and students perceive the MAP system, the counseling workshops, and the factors affecting their implementation?

Impact questions:

- Does assignment to the workshop group increase the academic plan completion rate, compared with the control group?
- Does assignment to the one-on-one group increase the academic plan completion rate, compared with the control group?
- Does assignment to the workshop group decrease the academic plan completion rate, compared with assignment to the one-on-one group?
- Do the percentages of students who make and attend counseling appointments differ across the three groups?
- Do the percentages of students who persist into the subsequent semester differ across the three groups?

The study used a randomized controlled trial to assess how two interventions affected completion rates for student academic plans

Cost-effectiveness question:

- How did the average cost per student differ across the three groups with respect to MAP, counseling session, and completion rates?

What the study found

This section presents three types of findings corresponding to the three types of research questions: implementation findings, impact findings, and cost and cost-effectiveness findings.

Implementation findings: The MAP system was implemented as planned

The South Orange County Community College District and Saddleback College spent nearly a year planning for the launch of the MAP system, assisted by REL West. Following the system's launch in September 2014, REL West assisted the college in collecting information to describe the implementation process, including qualitative information from focus groups and interviews. This section of the report describes implementation of the key components of the MAP system based on these data. (See figure A1 in appendix A for a logic model of the MAP system depicting how it was designed.)

Targeted nudges were generally delivered on schedule without major technological problems. The district's information technology department, with technical assistance from the REL West study team, created distinct profiles of students based on their study group assignments. These profiles triggered Sherpa, a district-developed recommendation and personalization engine, to deliver corresponding nudges to students. The South Orange County Community College District's information technology department also connected Sherpa with SARS—an off-the-shelf appointment system adopted by the district and integrated with its online education planning tool—to personalize the content of the nudges and track appointments made by students. The two systems worked in tandem to identify intervention group students who had not scheduled a counseling appointment or who had scheduled an appointment but had not kept it. Sherpa sent subsequent nudges only to students who had not yet attended a workshop or a one-on-one counseling session.

The district delivered up to 11 nudges to each student assigned to the workshop and one-on-one groups throughout the semester (see table A2 in appendix A). All students across the three study groups received an initial email nudge informing them about the MAP tool, the consequences if they did not complete an academic plan by the time they earned 15 semester units, and the opportunity to opt out of the study if they wished. Initial email

nudges to the two intervention groups also encouraged students to schedule a counseling appointment using a link included in the email. After this initial nudge only students in the two intervention groups continued to receive nudges (up to 10 additional nudges through January 12, 2015). Five types of nudges were sent over the semester: emails, MySite To-Do List items (see figure D3 in appendix D), robocalls, emails with a short video, and text messages (see table A2 in appendix A). The study was not designed to assess which type of nudge worked best; however, according to anecdotal evidence from counseling staff, robocalls elicited the strongest response from students. As one staff member noted, "Within an hour of sending out the phone-call nudge, we got 75 phone calls [to set up appointments]."

All study and nonstudy students were exposed to campuswide MAP promotion, including coverage in student orientation and during the matriculation process, posters and flyers around the campus, classroom announcements by counselors, and a page on the Saddleback College website to inform students about the need to complete an academic plan (see figure A1 in appendix A).

Students in the workshop and one-on-one groups could make a counseling appointment through a direct link included in their electronic nudges or by calling or visiting the counseling department. Slots in a counseling session were guaranteed

Students in intervention groups could make guaranteed appointments over a two week period. Students in the workshop and one-on-one groups could make a MAP counseling appointment in two ways: through a direct link included in their electronic nudges or by calling or visiting the counseling department. Slots in a MAP counseling session were guaranteed, and appointments could be scheduled for any offered time in the following two weeks. Students in the control group could only follow the standard practice of making a MAP counseling appointment by calling or visiting the counseling department, and they could only reserve a MAP counseling session for the following week (rather than the following two weeks). In addition, control group students were not guaranteed a slot in a session; they had to compete with other students for limited MAP counseling slots, as students always had, and slots for a given week were often filled by Monday afternoons of the previous week. Control group students could also try to make a walk-in appointment to see a counselor, but during busy times this could involve long waits.

Counseling workshops provided students with the structure and staffing to support their completion of an academic plan. The workshops were structured to ensure that students understood why and how to create an academic plan, could work on and complete their academic plan during the workshop, had access to counselors, and could leave the workshop as soon as their academic plan was reviewed and approved by the counselor (box A1 in appendix A shows the counselor-designed curriculum). To accommodate students' busy schedules, workshops were scheduled four days a week and were run regardless of how many students attended.

Counselors conducted 57 two-hour workshops during the fall semester, between September 29 and December 18, 2014. Workshops were held at the college's counseling department, in a computer lab set up for this purpose. The lab was equipped with 19 desktop computers, as well as a projector and a screen.

During the semester 612 (56.4 percent) of the students assigned to the workshop group made appointments to attend a workshop, and 523 (48.2 percent) of the students assigned to the workshop group attended a workshop. Workshop attendance ranged from 1 to 14 students, with an average of 6 students per workshop. Most workshops were attended by more than six students, but sparse attendance at the first few workshops lowered the average.[1]

Administrators and counselors attributed early low attendance to inadequate publicity about the MAP tool early in the semester. Also, the first nudge was erroneously sent after the first workshop was scheduled, resulting in no students showing up for the first workshop.

Nearly all the workshops (95 percent) were facilitated by one or two counselors from a pool of nine part-time counselors. (The effect of this spread of counselors is discussed in appendix B.) The college's counseling department assigned its part-time counselors to lead the workshops because their schedules allowed them to be slotted into a set of scheduled workshops more easily than full-time counselors. To standardize the quality of counseling across the two intervention groups, the counseling department arranged for training early in the semester by a lead counselor in order to familiarize counselors with the MAP tool and the structure and process for the workshops. The director of counseling services reported that the majority of counselors received six to eight hours of training. A typical counseling workshop is described in box 3.

Counselors conducted 57 two-hour workshops during the fall semester, and during the semester 612 (56.4 percent) of the students assigned to the workshop group made appointments to attend a workshop, and 523 (48.2 percent) of the students assigned to the workshop group attended a workshop

Box 3. A typical counseling workshop

Students file into the workshop computer lab as a counselor stands next to a computer at the front of the room. The room's projector flickers on, and students begin to quiet down behind individual computer screens at their seats. The counselor explains that, for the next 30 minutes or so, she will describe My Academic Plan (MAP), its purpose, and how to complete one. Students introduce themselves one by one, naming their major and whether they have heard of MAP. The counselor defines the MAP tool and displays MySite through the projector. Students log in to their MySite web portals, and a few begin to work on their academic plan, either for the first time or, if they had started one previously, picking up where they left off. An aide roves around the room to help latecomers log in.

The counselor explains the types of courses that need to be included in an academic plan: general-education requirements, electives, prerequisites, and major courses. For students who plan on transferring, she suggests reviewing University of California and California State University requirements, displaying on the screen the website ASSIST.org, showing the courses that satisfy the Intersegmental General Education Transfer Curriculum and the California State University General Education requirements for transfer.

The counselor then walks through the steps for creating an academic plan on her screen, including choosing a major and courses that fulfill requirements needed for their major or to transfer to another college. A few hands go up, and the counselor answers student questions. About 35 minutes into the workshop, the counselor's presentation is over, and students begin to work in earnest, sometimes speaking to the student next to them or peeking at each other's screens. The counselor walks around the room answering questions and approving students' academic plans. This continues as students complete their academic plans one by one. An hour into the workshop about half the students have had their academic plans approved and have left the room. Students waiting for their academic plans to be approved form a queue, and a second counselor joins the first counselor in approving students' academic plans and answering questions. This continues for about 15 minutes, until the two counselors have finished approving each student's academic plan. At that point, the first counselor checks the box next to the name of each student with an approved academic plan in the college data system that communicates with Sherpa to stop sending reminders to the student.

Note: This description of a typical workshop is a composite based on several workshop observations. Some students left a session without an approved academic plan for various reasons including needing more time to reflect on their education or career goals before completing the plan.

One-on-one counseling sessions, conducted in individual counseling offices, provided students with the information needed to complete their academic plan. Counselors conducted one-on-one counseling sessions with 72 (37.3 percent) of the students eligible for that intervention. These sessions occurred between September 25 and December 17, 2014. One-on-one sessions were scheduled to last an hour. Eleven full-time counselors led 61 percent of the sessions, while six part-time counselors led the remaining 39 percent. A typical session is described in box 4.

One-on-one counseling sessions operated as one-on-one sessions have always operated at the college, and they differed from the workshops in important ways. As one counselor explained,

> As always, when they're coming to see us individually, the first task is to find out why they're there, what they need, what they want, and then work with that, whatever that is. So that's very different than doing an orientation in how to put [a] MAP together. And we're putting it together often with them. They're not sitting at the computer. Sometimes they have one done, and we're reviewing it, if that's what they need to have done. We're reviewing it with them. Or we're creating it with them. So that's quite different than a workshop.

Box 4. A typical one-on-one counseling session

A counselor walks into her office with a student from the waiting area. The counselor sits in front of her computer screen, and the student sits next to the desk. The counselor introduces herself and asks the student about his academic plan and if he has heard about My Academic Plan (MAP) yet. The student expresses interest in electrical engineering and in transferring to a University of California school, but he's not completely sure what an academic plan is. When the counselor asks him how sure he is about his goals on a scale of 1–10, the student states "a 7."

The counselor then shares a paper that details transfer requirements for different University of California schools and explains the types of course and credit requirements needed and typical course options for each. The counselor asks the student what classes he liked in high school, explaining that this might give him a good idea of what courses to take to fulfill transfer requirements. The counselor then looks at her computer screen to confirm the student's registration date and suggests that the student set up an appointment with her to register for classes on that date.

Fifteen minutes into the session, the counselor pulls up the MAP tool on her computer screen, and the student inches his chair closer. She notices that he had already started creating an academic plan on his own. She walks through the student's academic plan with him, asking which of the course choices for each requirement sound interesting. As he answers, the counselor inserts courses into the MAP tool accordingly. She explains that these choices are not set in stone, and she asks the student if the process is making sense to him. For every class selected, the counselor describes details (such as professors, course popularity, and content). The counselor continues inserting courses into the MAP tool to create a semester-by-semester plan according to the student's input. This takes about 35 minutes. The student reviews the chosen courses, and the counselor signs and prints out a copy of the academic plan for the student. With 10 minutes left in the hour-long session, she makes the student a folder with materials and reminds him to come to see her during registration.

Note: Some students left the session without an approved academic plan for various reasons including needing more time to reflect on their education or career goals before completing the plan.

Students were generally satisfied with the workshops. According to a college-administered survey completed by approximately 163 students immediately after working on their academic plans in the workshops but before leaving their computers, about 90 percent of survey respondents agreed that they were satisfied with the workshop, and about 84 percent agreed that the workshop met their academic planning needs (see table C4 in appendix C).[2] In open-ended responses students reported that the workshops helped them to "lay out the classes [they] needed to take" and to "plan for the future" and that the counselors were "very helpful" (see figure C1). Some students liked working together and hearing the advice given to other students, and many valued the individual attention that they received from the counselors in the workshops. Suggested improvements included adding more counselors and allowing for more individual attention from counselors (see figure C3). As one student put it, overall, the workshops were "easy, simple, and necessary." One student reported that the workshop exceeded expectations, explaining, "I expected just to have my original MAP [academic plan] confirmed and locked in, but it ended up being a lot more helpful than I thought it was going to be."

Students in the workshops liked working together and hearing the advice given to other students, and many valued the individual attention that they received from the counselors

Despite initial concerns of some counselors that the group format of the workshops might diminish the usefulness of academic plans, students reported feeling confident in their completed academic plans. During the planning and early implementation phases of the MAP system, some counselors expressed concern that they would not be able to provide students with enough individualized attention to help them complete a useful and meaningful academic plan.[3] Four of the eight counselors in the focus group explained that students arrived at the workshops "all over the map" and "at different developmental stages and [with different] plan[s]." As a result, these counselors felt "pulled in many directions" and worried that their assistance was therefore less effective than it would have been in one-on-one sessions. As one counselor stated, "It's when they're all in different places, different majors, undecided, it's difficult to feel that confidence when you look at their plan, because you haven't done that one-on-one time."

Notwithstanding some counselors' concerns, all workshop students who participated in focus groups reported feeling confident about their academic plans. As one workshop student explained, "I am pretty confident. I feel a lot more relaxed, though, because I know what classes I'll be taking each semester. I'll have a plan, and it's really helped me." In addition, according to the college-administered survey, about 89 percent of workshop students agreed that they intended to use their academic plans to reach their academic goals at Saddleback (see table C4 in appendix C).

Impact findings: A higher percentage of the intervention group students than the control group students completed academic plans

Students assigned to the workshop or one-on-one counseling with nudging and guaranteed access to counseling were significantly more likely to attend a counseling session and to complete an academic plan than students in the control group. There was no significant difference in session attendance or academic plan completion between the workshop and one-on-one counseling groups. Nudging and guaranteed access to counseling clearly increased the completion rate but failed to ensure that all students completed an academic plan: a majority of students in all three groups did not complete an academic plan.

Students assigned to either intervention group who received nudging and a guaranteed counseling appointment were significantly more likely to schedule and attend appointments than were students in the control group. About 56 percent of students assigned to the workshop group scheduled a workshop appointment, and 48 percent attended one, while about 33 percent of control group students scheduled a counseling appointment, and 30 percent attended one (table 2). The differences between the outcomes for the workshop and control groups are statistically significant. Similarly, about 59 percent of students assigned to the one-on-one group scheduled a counseling appointment, an estimated difference of about 26 percentage points over the control group. About 50 percent of the one-on-one group attended their appointments, an estimated difference of about 20 percentage points over the control group. These differences are large and statistically significant.

There was no significant difference in session attendance or academic plan completion between the workshop and one-on-one counseling groups

Students who were assigned to either intervention group and who received nudging and a guaranteed counseling appointment were significantly more likely to complete an academic plan than were students in the control group. Over the five months of the study, about 38 percent of students randomly assigned to the workshop group and 42 percent of the students randomly assigned to the one-on-one counseling group completed an academic plan, compared with about 19 percent of students in the control group (see table 2). This resulted in a 20 percentage point difference between workshop group students and control group students and a 23 percentage point difference between one-on-one-group students and control group students. Both differences are statistically significant.

Nevertheless, a majority of students—62 percent in the workshop group, 58 percent in the one-on-one group, and 81 percent in the control group—failed to complete an academic plan. While nudging and guaranteed access to counseling sessions improved completion rates, additional intervention is needed to ensure that all students engage in academic planning.

Table 2. Differences in percentages of students who scheduled and attended My Academic Plan counseling sessions, completed academic plans, and enrolled the following spring, by study group, 2014/15

Outcome measure	Workshop group (percent)	One-on-one group (percent)	Control group (percent)	Difference between workshop and control groups (percentage points)	Difference between one-on-one and control groups (percentage points)	Difference between workshop and one-on-one groups (percentage points)[a]
Student scheduled counseling appointment	56.4	58.5	32.6	23.8***	26.0***	–2.1
Student attended counseling appointment	48.2	50.3	30.1	18.1***	20.2***	–2.1
Student completed academic plan	38.2	42.0	18.8	19.5***	23.2***	–3.7
Student enrolled in spring 2015 (persistence)	77.8	77.2	79.8	–2.0	–2.6	0.6

*** Significant at $p < .001$.

Note: The total sample size was 1,763. There were 1,085 students in the workshop group, 193 students in the one-on-one group, and 485 students in the control group. Rounding may cause slight discrepancies in differences. Statistical tests were conducted using t-test statistics generated by ordinary least squares regressions. See appendix B for model details.

a. Describes findings related to the exploratory research questions. Values should be interpreted with caution. The lower sample size for the comparisons between the one-on-one counseling group and the workshop group means that causal inference is not possible.

Source: Authors' calculations using 2015 administrative data from the South Orange County Community College District.

There were no statistically significant differences between the two intervention groups in the percentage of students who scheduled or attended counseling appointments or completed an academic plan. Students assigned to the workshop group scheduled and attended counseling appointments at nearly the same rate as students assigned to the one-on-one group (see table 2). The same is true for completion rates. This finding suggests that the workshops and the one-on-one counseling sessions have similar effects on the outcomes analyzed in this study, but limitations in the study design suggest caution in directly comparing results for the two intervention groups (see section on Limitations of the study).[4]

While nudging and guaranteed access to counseling sessions improved completion rates, additional intervention is needed to ensure that all students engage in academic planning

Many intervention group students failed to take the first step of scheduling an appointment. Being assigned to the workshop or one-on-one counseling groups increased the percentage of students who scheduled and attended appointments. However, more than 40 percent of students assigned to the workshop or one-on-one counseling groups did not schedule a counseling appointment. About 85 percent of students from the workshop group and about 86 percent of one-on-one group followed through on their appointments. While the percentage of control group students who made a counseling appointment (33 percent) and who attended a counseling appointment (30 percent) was much smaller, some 92 percent of the control group students who did schedule an appointment also attended the appointment.

Neither intervention appeared to affect enrollment in the following semester. About the same percentages of students in each study group enrolled in the following semester (spring 2015): about 78 percent of students assigned to the workshop group, about 77 percent of students assigned to the one-on-one group, and about 80 percent of students assigned to the control group (see table 2). No enrollment differences between any of the groups were statistically significant.

Cost-effectiveness findings: The workshop group was the most cost effective of the two interventions, based on cost per academic plan completed

The per student cost of counseling was highest for the one-on-one counseling group. The workshop group and the control group had similar costs per student. The average per-student cost was $27 for the workshop group, $46 for the one-on-one group, and $24 for the control group (table 3). See table C5 in appendix C for additional details about how costs presented in table 3 were calculated.

The costs in table 3 assume that counseling is delivered by a mix of full-time and part-time counselors. If all sessions were taught by full-time (more expensive) counselors, the cost per student would increase for each group: the workshop group cost would increase from $27 to $34, the one-on-one group cost increase from $46 to $53, and the control group cost would increase from $24 to $28 (see table C5 in appendix C).

The workshop group was the most cost-effective option when the cost of each counseling approach is compared to the corresponding outcomes. Cost-per-outcome values are estimated by dividing the cost of each group by the total number of desired outcomes (counseling sessions attended and academic plans completed) in that group. These outcomes were selected for the cost analysis as they were the primary outcomes in the impact analysis. Comparing these values shows how cost effective each approach was at producing

Table 3. Costs and cost-effectiveness of workshop and one-on-one counseling groups for My Academic Plan compared with the control group, 2014/15

Outcome	Workshop group[a]	One-on-one group	Control group
Cost per study student (dollars)	27	46	24
Percentage of students attending a counseling session	48.2	50.3	30.1
Cost per counseling session attended (dollars)	55	91	79
Percentage of students completing an academic plan	38.2	42.0	18.8
Cost per academic plan completed (dollars)	70	109	126
Number of observations	1,085	193	485

Note: All costs are in 2014 dollars. For detailed notes about how costs were calculated, see table C5 in appendix C.

a. The estimated cost per student is based on an average session size of 7.95 students. The cost per student would fall if the average workshop size increased.

Source: Cost estimates are calculated from program expenditure data reported by Saddleback College and salary information for full-time and part-time counselors reported by the California State Controller's Office. Impacts on attending counseling and completing an academic plan are estimated using 2015 administrative data from the South Orange County Community College District.

desired outcomes compared with other approaches. The workshop group had a lower cost per student outcome than the one-on-one group and a similar cost per student outcome to the control group. Additionally, the workshop group produced outcomes that were similar to those of the one-on-one group but better than the control group. As a result, the workshop group is the most cost-effective counseling group (lowest cost per desired outcome).

The workshop group had a lower cost per student outcome than the one-on-one group and a similar cost per student outcome to the control group and produced outcomes that were similar to those of the one-on-one group but better than the control group

The workshop group was the most cost-effective with respect to students attending counseling sessions. The cost per counseling session attended was lowest (most cost-effective) for the workshop group and highest (least cost-effective) for the one-on-one group. Specifically, the cost per counseling session attended for the workshop group was $55, compared with $91 for the one-on-one group and $79 for the control group (see the third row of table 3). An alternative cost per counseling session attended was estimated that assumes all counseling was provided by full-time counselors rather than by the actual mix of full-time and part-time counselors (see table C5 in appendix C). This assumption does not change the results, as the cost per counseling session attended remains lowest for the workshop group and highest for the one-on-one group.

Similarly, the workshop group was the most cost effective with respect to the students completing academic plans. The cost per academic plan completed was lowest (most cost effective) for the workshop group and highest (least cost effective) for the control group. Specifically, the cost per academic plan completed for the workshop group was $70 (see the fifth row of table 4). In comparison, the costs per academic plan completed were $109 for the one-on-one group and $126 for the control group. Cost per academic plan completed values are also estimated for an alternative scenario in which all groups receive counseling from full-time counselors only. The results are unaffected by this assumption.

Implications of the study findings

This randomized controlled trial offers evidence that targeted nudging to encourage students to attend either workshop or one-on-one counseling sessions and guaranteed access to these counseling sessions significantly increases the likelihood that students will

complete an academic plan, compared with students who did not have access to these resources. The study also suggests that students who receive the interventions are more likely than control group students to schedule and attend a counseling appointment. From a fiscal perspective the study suggests that holding counseling workshops is a promising, cost-effective strategy to ensure that greater numbers of students complete academic plans. Counseling workshops substantially increased the number of students who completed an academic plan at a lower cost per desired outcome than one-on-one counseling or "business as usual." The study found that the components of the MAP system (targeted nudging, guaranteed counseling services, online academic planning tool, and the integrated data system) were implemented, for the most part, as intended and were operational for the duration of the study. This allowed for successful scaling of counseling support for student academic planning. It also resulted in making the process of completing an academic plan for both counselors and students "easy, simple, and necessary," as described by a student.

This study offers evidence that targeted nudging to encourage students to attend either workshop or one-on-one counseling sessions and guaranteed access to these counseling sessions significantly increases the likelihood that students will complete an academic plan and suggests that holding counseling workshops is a promising, cost-effective strategy

The district's experience suggests that colleges seeking scalable, sustainable, efficient, and effective methods to encourage students to complete an academic plan could use an online system that nudges students and guarantees them counseling appointments to achieve similar results, as long as they have access to the required technology to take full advantage of limited counseling capacity.[5]

It is important to note that although the nudging and guaranteed counseling components of the MAP system significantly increased the number and percentage of students who completed an academic plan, they did not work for all students. About half the students in the intervention groups took the first step of making an appointment; the other half did not, even after receiving up to 11 nudges encouraging them to do so during the semester and being offered guaranteed counseling services. This study shows that while nudging and guaranteed access to group and individual counseling clearly helped get more students to initiate and complete the academic planning process, additional support is needed to get all students to complete an academic plan. California's decision to bar students from registering for classes if they fail to complete an academic plan by the time they earn 15 credits will boost—and already has boosted—the percentage of students who complete an academic plan. In states where such a policy does not exist, group counseling, enabled by technology, may be one of the most effective tools colleges can use to scale academic planning.

Student success is at the heart of why the South Orange County Community College District invested the resources and effort to create and evaluate a new approach to academic planning. The MAP system was designed to harness the power of technology, use existing counseling capacity more efficiently, and facilitate increased access to counseling services for larger numbers of students. As one district administrator put it:

> In California we have a very real challenge ahead of us that ultimately could impact the success of millions of students. Very few dispute the benefit of students creating and following an academic plan; however, we don't have enough counselors to adequately guide students in this complex process. The answer is to use intelligent technology that leverages the scarce and valuable resource of counselors and broadens their impact beyond the traditional one-on-one counseling sessions.

Limitations of the study

This study has six main limitations. First, it lacked sufficient power to provide more than suggestive evidence that counseling workshops are as effective as one-on-one counseling in getting students to complete an academic plan. While researchers observed no statistically significant differences between the percentages of students who completed a plan in these two study groups, the limited sample size may have masked meaningful differences.

Second, the study was not designed to test the relative importance of nudging and the guaranteed access to a counseling session. Understanding the role that each of these components played in changing student behavior would be important information for colleges designing future student support programs.

Third, because of time constraints, the study did not track student persistence for more than one semester. Although there were no significant group differences in persistence (enrollment in the semester after the intervention), differences could emerge over time. It is possible that the differences would increase as students earn 15 credits, after which time their registration is blocked unless they have an approved academic plan. The majority of the students in the sample had not earned 15 credits by the time they registered for the following semester, meaning that students were able to register without a completed academic plan.

Fourth, the study was not designed to compare the quality of the academic plans across the three study groups, as measured by, for example, how useful they are for students or whether students adhere to the plans as they progress toward their goals. This information could be important given the concerns expressed by some counselors about the quality of the academic plans completed in the workshop sessions as compared with those prepared in traditional one-on-one sessions. Quality measures could have varied by intervention group, particularly as they relate to student outcome measures. This could be important information for colleges to have as they make decisions about counseling programs for education planning.

Fifth, because the college disproportionately assigned part-time staff to teach the workshops, the impact estimates may be biased due in part to the characteristics of part-time counselors, which may have differed from full-time counselors in ways that mattered for the outcomes. For example, tenured full-time staff may be less motivated than adjuncts to deliver counseling in a group setting or rely on technology to guide their interactions with students.

Finally, and perhaps most important, the study was not designed to answer the critical question of whether the process of developing an academic plan improves students' chances of successfully attaining academic goals and transitioning to a career. As an increasing number of colleges require students to develop education plans, the time has come for rigorous studies that address the impact of academic planning on academic and career outcomes.

Appendix A. Study background and intervention characteristics

This appendix includes the descriptions, tables, and figures that supplement the information about the study in the report narrative. Included are descriptions of the college's setting and student population; a My Academic Plan (MAP) system logic model and illustrations of the student flow through the MAP system; and the counseling workshop curriculum, the content and format of the nudges sent to students, and a description of the comparison conditions.

Study setting

The study took place in the South Orange County Community College District in southern California. The district serves a suburban community approximately one hour's drive from downtown Los Angeles. The district is home to two colleges that are relatively autonomous: each has its own president and administrative staff and a somewhat distinct education culture. Saddleback College, the college that participated in the study, serves the city of Mission Viejo; Irvine Valley College serves the city of Irvine. About 33,000 students were enrolled in the district in fall 2014, with approximately 20,000 of them attending Saddleback and 13,000 attending Irvine Valley. At Saddleback, students can earn an associate of arts degree or certificate in more than 190 academic and career program areas. According to the Integrated Postsecondary Education Data System data from the National Center for Education Statistics, during the 2014/15 academic year, 54 percent of Saddleback students were White, 9 percent were Asian, 25 percent were Hispanic/Latino, and 2 percent were Black (table A1). Sixteen percent of district students receive Pell grants, which provide need-based grants to low-income college students.

Table A1. Characteristics of students at Saddleback College, fall 2014

Student characteristic	Number or percent
Enrollment	
Total undergraduate enrollment	20,007
Receiving Pell grant (percent)	16
Gender (percent)	
Male	46
Female	54
Race/ethnicity (percent)	
Asian or Pacific Islander	9
Black	2
Hispanic	25
White	54
Other	10
Age (percent)	
Younger than age 18	2
Ages 18–24	62
Ages 25–64	34
Age 65 and older	1

Note: Percentages may not sum to 100 because of rounding.

Source: Authors' calculations using 2014 data from the National Center for Education Statistics Integrated Postsecondary Education Data System.

Saddleback had 14 full-time counselors and 23 part-time counselors at the time of the study. The full-time counselors divide their time between counseling and teaching. During the study part-time counselors led most of the workshops, while full-time counselors provided most of the counseling for students in the one-on-one and control groups. The college provided training to all counselors on how to use the MAP tool and how to advise students in the group setting, which may have helped to mitigate variations in counselors' experience and familiarity with the MAP tool.

This study used a random assignment design with three conditions. Students were randomly assigned to one of three groups: one of the two intervention groups (the workshop group or the one-on-one group, both of which involved the nudging and guaranteed counseling services of the MAP system) or the control group, which did not receive an intervention beyond what was available to all students.

The My Academic Plan system

The development and testing of the MAP system was a collaborative effort by the South Orange County Community College District, Saddleback Community College, and Regional Educational Laboratory (REL) West. The intervention was designed to increase the number of incoming students who complete a counselor-approved semester-by-semester plan listing the courses they need to achieve their education goal, whether it is a certificate, an associate's degree, or transfer to a four-year institution. With such a plan, it was hoped, students would be more likely to graduate from college within a reasonable time and earn a credential that would help them transition to the workforce or to a four-year institution.

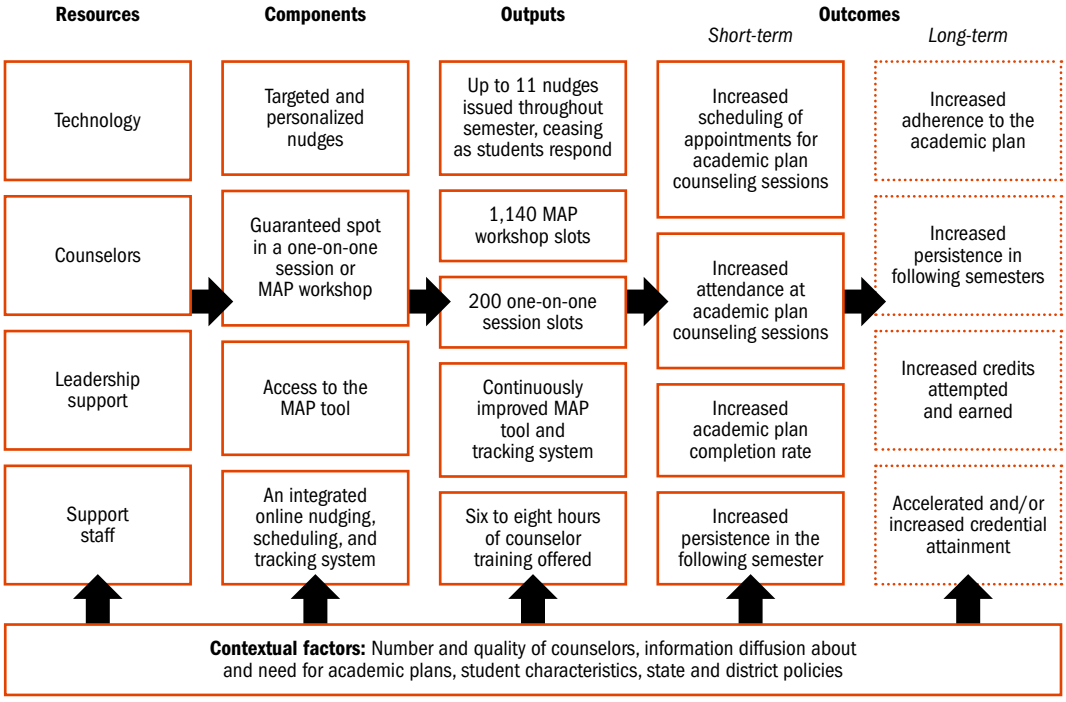
The MAP system consists of four key components, listed in box 1 in the main report and the logic model in figure A1, which presents the resources, components, outputs, and short- and long-term outcomes of the MAP system. Some elements of the components were in place in the district before the study began, some were new, and others improved on existing strategies. What is new about the MAP system is that it brought together all of the components in a coherent, seamless system that made creating an academic plan and having it reviewed and approved by a counselor easier for both counselors and students.

Intervention condition

Students in the two intervention groups were assigned to nudges and guaranteed access to one of two counseling methods. The two intervention groups received essentially identical treatment, except that one involved random assignment to group counseling (the workshop group), and the other involved random assignment to individual counseling sessions with a counselor (the one-on-one group).

The ideal student flow through the MAP system for workshop and one-on-one student groups at Saddleback College is illustrated in figure A2. The workshop curriculum developed by Saddleback College counselors is shown in box A1. The curriculum was available for internal use only and is not available elsewhere. The nudges sent to students during the course of the study are described in table A2.

Figure A1. The My Academic Plan (MAP) system logic model, Saddleback College, 2014/15



Note: Boxes with dotted lines represent outcomes not measured in this study.

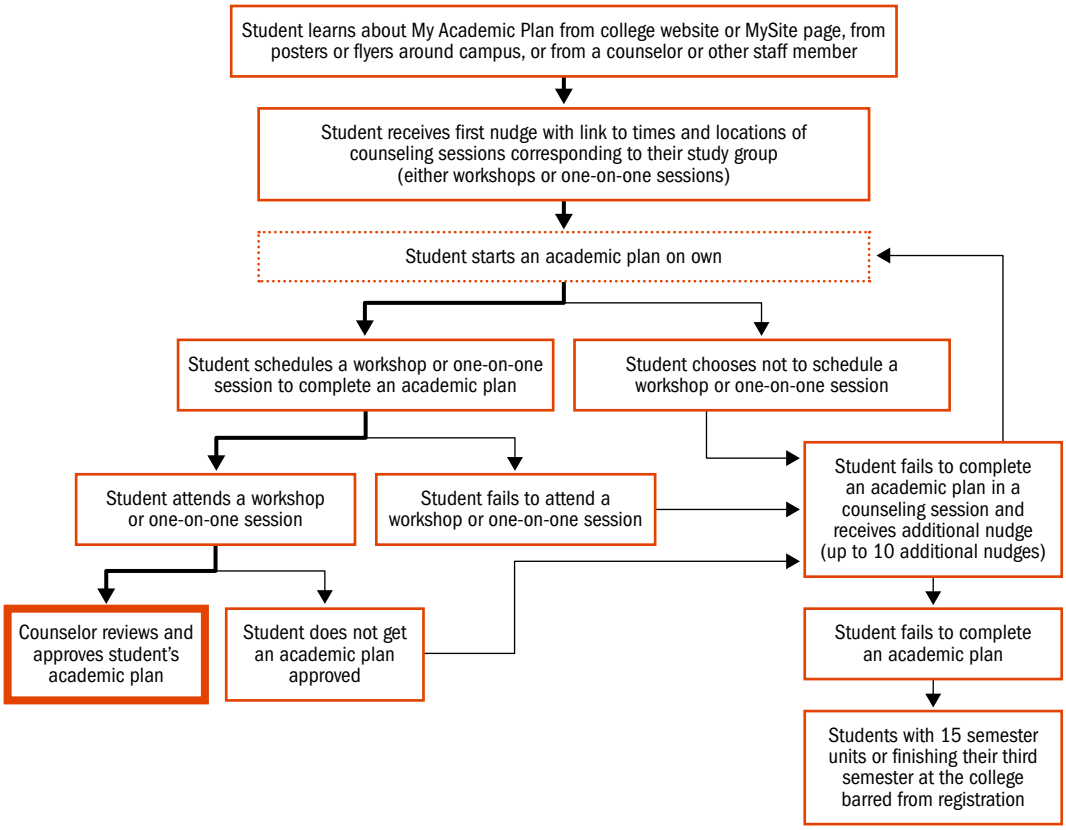
Source: Authors' compilation.

Comparison condition

The control group was free to access any counseling service or other supports available to all students at the college to complete an academic plan, including the MAP tool and counseling support. However, these students did not receive the intensive nudging or the guaranteed access to counseling that were provided to the intervention groups. As part of the study, control group students received only a single email nudge explaining how they could opt out of the study and advising them to complete an academic plan. The completion process for control group students is illustrated in figure A3. Although 10 control group members were registered as having attended a workshop designated for workshop-group students (and are therefore considered to be "crossovers"), this was not permissible according to the study protocols. The small number of crossovers had no significant effect on the findings.

The existence of the study did not appear to affect the control condition. That is, control group students had the same access to the online MAP tool and the same access to counselors that existed before the study. The counseling department ensured such access by calling in a sufficient number of part-time counselors to meet the additional MAP-related demand on the department that the study generated. According to interviews conducted with administrators in the counseling department, the wait time to make an appointment or drop in to see a counselor for the control group students was not lengthened due to the study.

Figure A2. Student flow for My Academic Plan workshop and one-on-one intervention groups, Saddleback College, 2014/15



Note: Thick arrows indicate the ideal path for workshop and one-on-one counseling students.

Source: Authors' compilation.

Box A1. Curriculum for My Academic Plan workshops developed by Saddleback College counselors, 2014/15

Introduction to the My Academic Plan tool (2 minutes)

Explain to students that the My Academic Plan (MAP) tool is a computerized academic planning program and the purpose of the workshop is to develop a comprehensive academic plan. Remind students that they will need to have a completed comprehensive academic plan approved by a counselor by the time they reach 15 units of credit.

MySite/My Academic Plan (3 minutes)

- Show students how to access the MAP tool through MySite and how to choose a goal of a Certificate, associate degree, or transfer.
- Explain that for the associate degree and transfer goals, students will need to complete general education and major preparation requirements as presented on MAP.
- Discuss choosing a major and the use of ASSIST (an online student-transfer information system that shows how course credits earned at one California college or university can be applied when transferred to another) in identifying major preparation requirements (ask students who are undecided to choose a Liberal Studies major).

(continued)

Box A1. Curriculum for My Academic Plan workshops developed by Saddleback College counselors, 2014/15 *(continued)*

General education (5 minutes)

- Hand out general education patterns flat-sheets (Native pattern, California State University General Education, University of California or California State University Intersegmental General Education Transfer Curriculum) and explain that each student who plans on receiving an associate degree or transferring will need to follow one of these general education patterns and will be asked to select one to complete an academic plan.
- Discuss math and English placement scores and explain the numbering system used to identify if a course counts for the associate degree or transfers to the California State University system or the University of California system.
- Discuss clearing of prerequisites.

Major (ASSIST or Saddleback College Catalog) and electives (3 minutes)

- Show students how to select a college and a major using the MAP tool and have students select a Liberal Studies major if undecided regarding choice of major.
- Explain the use of electives to reach the 60 units needed for an associate degree or to transfer and how to select electives using the MAP tool.

Example of a completed comprehensive education plan—page 2 of the academic plan from the My Academic Plan tool (2 minutes)

- Let students know that this is the page you want them to show you when they have a completed plan. Point out course sequences in math and English.

Semester-to-semester plan (100 minutes)

- Have students access the MAP tool through MySite and develop a comprehensive education plan.
- Assist students with accessing the MAP tool, setting an education goal, and choosing classes.

Review and approve academic plan and check off as completed

- Use the online list to check off names of students whose academic plans are completed (reviewed and approved by a counselor) to meet the comprehensive education plan requirement.

Closing comments—remind students about

- Counseling appointments.
- Walk-in counseling.
- Applied psychology classes.
- Advanced Placement scores.

Table A2. Reminders (nudges) sent to Saddleback College students in study sample, 2014/15

Nudge	Group	Format	Date	Content
1	Control group	Email	9/25/14	Hi {FirstName}, Welcome to Saddleback! Do you know that as a new student, you are now required to complete a comprehensive academic plan? And do you know that if you do not have a counselor review this plan by the time you earn 15 units you may not be able to register for classes? Here at Saddleback, we have a great online tool called "My Academic Plan" (MAP) students use to create a plan. Why is having a MAP a great idea? 1. A MAP can keep you on track because it spells out the courses you need to meet all requirements for your major and general education. 2. A MAP is not set in stone: you can make changes anytime! 3. All students must have a counselor-reviewed MAP or they may not be able to register for classes! You are among a group of students who have been selected to participate in a special study the college is conducting this Fall to learn the best ways to help all students at Saddleback complete a MAP. As part of this study, Saddleback will share your student records data with a research project through REL West. The data includes personal identifiers, such as name and student ID. In the future, researchers may contact you to ask questions about your experiences completing your educational plan. Information that REL West and Saddleback collect for the study will be kept confidential and will be used for research purposes only. Participation in the study will not affect your standing in college or your access to any normal services. If you have questions about the study, or you don't want to be contacted or your data to be shared, please contact Saddleback Counseling at (949) 582–4570.

(continued)

Table A2. Reminders (nudges) sent to Saddleback College students in study sample, 2014/15 *(continued)*

Nudge	Group	Format	Date	Content
1	Workshop	Email	9/25/14	Hi {FirstName}, Welcome to Saddleback! Do you know that as a new Saddleback student, you are now required to complete a comprehensive academic plan? And do you know that if you do not have a counselor review this plan by the time you earn 15 units you may not be able to register for classes? Here at Saddleback, we have a great online tool called "My Academic Plan" (MAP) students use to create a plan. You have been selected to attend a special 2-hour-long workshop in which a Saddleback counselor will walk you through the steps to complete a MAP. No waiting in line! To take advantage of this opportunity and to reserve a space in one of these workshops click here: http://www.saddleback.edu/esars/mdrcwrkshp or call (949) 582–4570. Why is having a MAP a great idea? 1. A MAP can keep you on track because it spells out the courses you need to meet all requirements for your major and general education. 2. A MAP is not set in stone: you can make changes anytime! 3. All students must have a counselor-reviewed MAP or they may not be able to register for classes! You are among a group of students who have been selected to participate in a special study the college is conducting this Fall to learn the best ways to help all students at Saddleback complete a MAP. As part of this study, Saddleback will share your student records data with a research project through REL West. The data includes personal identifiers, such as name and student ID. In the future, researchers may contact you to ask questions about your experiences completing your educational plan. Information that REL West and Saddleback collect for the study will be kept confidential and will be used for research purposes only. Participation in the study will not affect your standing in college or your access to any normal services. If you have questions about the study, or you don't want to be contacted or your data to be shared, please contact Saddleback Counseling at (949) 582–4570.

(continued)

Table A2. Reminders (nudges) sent to Saddleback College students in study sample, 2014/15 *(continued)*

Nudge	Group	Format	Date	Content
1	One-on-One	Email	9/25/14	Hi {FirstName}, Welcome to Saddleback! Do you know that as a new Saddleback student, you are now required to complete a comprehensive academic plan? And do you know that if you do not have a counselor review this plan by the time you earn 15 units you may not be able to register for classes? Here at Saddleback, we have a great online tool called "My Academic Plan" (MAP) students use to create a plan. You have been selected to meet one-on-one with a counselor for 60 minutes to complete your MAP in which a Saddleback counselor will walk you through the steps to complete a MAP. No waiting in line! To take advantage of this opportunity and to schedule a counseling appointment click here: http://www.saddleback.edu/esars/mdrcindv or call (949) 582–4570. Why is having a MAP a great idea? 1. A MAP can keep you on track because it spells out the courses you need to meet all requirements for your major and general education. 2. A MAP is not set in stone: you can make changes anytime! 3. All students must have a counselor-reviewed MAP or they may not be able to register for classes! You are among a group of students who have been selected to participate in a special study the college is conducting this Fall to learn the best ways to help all students at Saddleback complete a MAP. As part of this study, Saddleback will share your student records data with a research project through REL West. The data includes personal identifiers, such as name and student ID. In the future, researchers may contact you to ask questions about your experiences completing your educational plan. Information that REL West and Saddleback collect for the study will be kept confidential and will be used for research purposes only. Participation in the study will not affect your standing in college or your access to any normal services. If you have questions about the study, or you don't want to be contacted or your data to be shared, please contact Saddleback Counseling at (949) 582–4570.
2	Workshop	MySite to-do list item	9/25/14	Sign up to see a counselor to complete your MAP. Click here http://www.saddleback.edu/esars/mdrcwrkshp or call (949) 582–4570.
2	One-on-one	MySite to-do list item	9/25/14	Sign up to see a counselor to complete your MAP. Click here http://www.saddleback.edu/esars/mdrcindv or call (949) 582–4570.
3	Workshop	Email with Flipagram	10/6/14	This flipagram was made just for you—http://youtu.be/JCXp8ebKVB4. Get your MAP completed and approved by a counselor. Click here http://www.saddleback.edu/esars/mdrcwrkshp or call (949) 582–4570.
3	One-on-one	Email with Flipagram	10/6/14	This flipagram was made just for you—http://youtu.be/JCXp8ebKVB4. Get your MAP completed and approved by a counselor. Click here http://www.saddleback.edu/esars/mdrcindv or call (949) 582–4570.
4	Workshop	Robocall	10/17/14	This is the Saddleback College Counseling Department. We noticed that you haven't made a workshop appointment yet. This puts you at risk for losing your priority registration status. Luckily, it's not too late to schedule a meeting with a counselor. Call us at (949) 582–4570 to schedule your workshop appointment today.
4	One-on-one	Robocall	10/17/14	This is the Saddleback College Counseling Department. We noticed that you haven't made a MAP appointment yet. This puts you at risk for losing your priority registration status. Luckily, it's not too late to schedule a meeting with a counselor. Call us at (949) 582–4570 to schedule your counseling appointment today.
5	Workshop	Email	11/3/14	Spring registration will begin soon! Don't lose your priority registration. Complete your MAP today and have it approved by a counselor! To reserve your space in a workshop click here: http://www.saddleback.edu/esars/mdrcwrkshp or call (949) 582–4570 to get started.

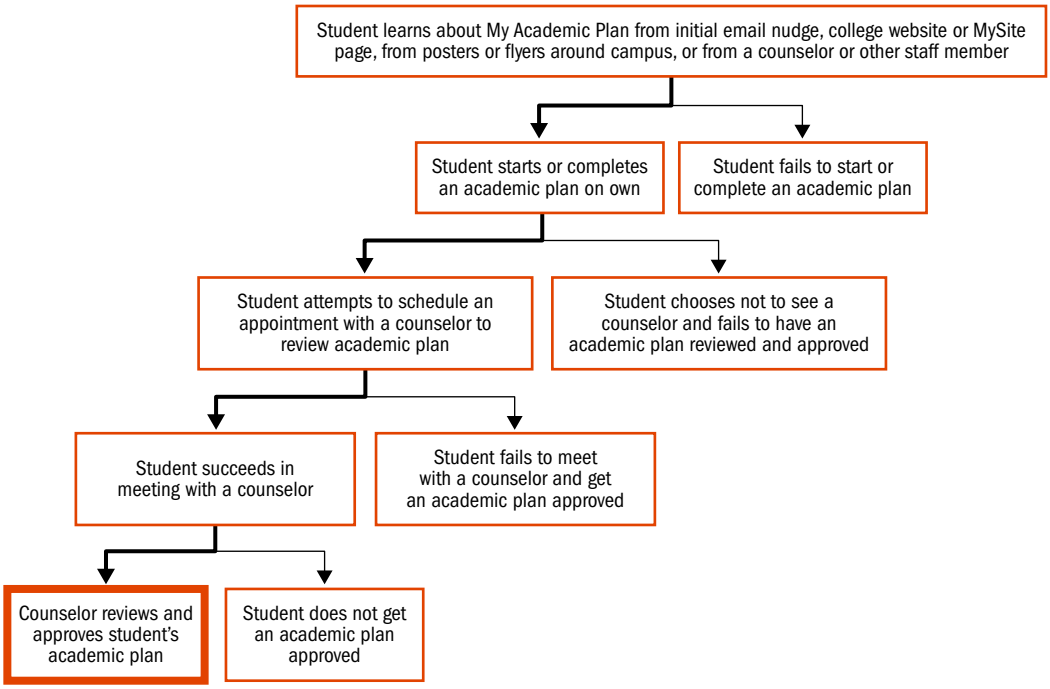
(continued)

Table A2. Reminders (nudges) sent to Saddleback College students in study sample, 2014/15 *(continued)*

Nudge	Group	Format	Date	Content
5	One-on-one	Email	11/3/14	Spring registration will begin soon! Don't lose your priority registration! Complete your MAP today and have it approved by a counselor! To make an appointment with a counselor click here: http://www.saddleback.edu/esars/mdrcindv or call (949) 582–4570 to get started.
6	One-on-one and workshop	Text message	11/3/14	Saddleback College Reminder—Complete your MAP! Don't lose your priority registration! Call (949) 582–4570 to see a counselor.
7	Workshop	Email	11/10/14	You haven't made a MAP appointment yet. Don't lose your priority registration status. Click here to attend a workshop and have your academic plan approved by a counselor: http://www.saddleback.edu/esars/mdrcwrkshp or call (949) 582–4570.
7	One-on-one	Email	11/10/14	You haven't made a MAP appointment yet. Don't lose your priority registration status. Click here to schedule an individual appointment with a counselor to have your academic plan approved: http://www.saddleback.edu/esars/mdrcindv or call (949) 582–4570.
8	Workshop	Email	12/2/14	Spring registration has begun and completing a MAP will help keep you on track to meeting your educational goal. You can still attend a workshop session and have a counselor approve your academic plan! Click here: http://www.saddleback.edu/esars/mdrcwrkshp or call (949) 582–4570 to reserve a spot.
8	One-on-one	Email	12/2/14	Spring registration has begun and completing a MAP will help keep you on track to meeting your educational goal. You can still attend a MAP counseling session and have a counselor approve your academic plan! Click here: http://www.saddleback.edu/esars/mdrcindv or call (949) 582–4570 to reserve a spot.
9	Workshop and one-on-one	Text message	12/11/14	Saddleback College Reminder—Next week is the last chance to get your MAP approved by a counselor for fall. Call (949) 582–4570.
10	Workshop	Email	1/7/15	Happy New Year! Get the New Year off to a great start! Complete your MAP today and have it approved by a counselor. To reserve your space in a workshop click here: http://www.saddleback.edu/esars/mdrcwrkshp or call (949) 582–4570 to get started.
10	One-on-one	Email	1/7/15	Happy New Year! Get the New Year off to a great start! Complete your MAP today and have it approved by a counselor. To make an appointment with a counselor click here: http://www.saddleback.edu/esars/mdrcindv or call (949) 582–4570 to get started.
11	Workshop and one-on-one	Text message	1/12/15	Saddleback College Notice—Maintain your priority registration status; reserve a seat at a MAP counseling session. Call (949) 582–4570.

Source: Authors' compilation.

Figure A3. Business as usual: My Academic Plan completion process for control group students, 2014/15



Note: Thick arrows indicate the ideal path for control group students.

Source: Authors' compilation.

Appendix B. Study data sources, design and analysis

This appendix describes the data sources, study participants, random assignment, definitions of outcome measures, analytic approach, statistical adjustments, treatment of missing data, and qualitative data collected and analyzed.

Quantitative data sources

A total of 1,839 students were randomly assigned into the study. Random assignment was conducted at the student level. Due to college preferences and capacity considerations, assignment to the one-on-one group was capped at 200 students and assignment to the workshop group was capped at 1,140. This left a maximum of 499 slots for the control group.[6] Within the 1,839 students who were randomly assigned, 24 students opted out of the study, and 52 students were found to have completed an academic plan prior to random assignment. These students were therefore ineligible for the study and were removed from the analytic sample, leaving 1,763 students.

Data were collected for all 1,815 students who did not opt out of the study, including the 52 students who were found to be ineligible because they had completed an academic plan prior to random assignment. The ineligible students were dropped from the sample before the impact models were run. The district's database provided data on counseling appointments (both scheduled and attended), academic plan completion, enrollment in spring 2015, and student demographic information.

Data for the outcome measures came from electronic records collected by the college's counseling department and transcript data maintained by the district.

The appointment scheduling data are based on all appointments scheduled by study students after random assignment (September 17, 2014) and before the end of the follow-up period (February 2, 2015). Data on attending appointments are based on all appointments scheduled between the beginning of random assignment (September 17, 2014) and the end of the follow-up period (February 2, 2015), as recorded in Sherpa. Some of these appointments occurred after the end of the intervention period.

Completion data are based on the number of students who did not have a counselor-approved academic plan prior to random assignment (September 17, 2014) and completed an academic plan at least once before the end of the follow-up period (February 2, 2015), as recorded in Sherpa. It is possible for students to revise their academic plan over the course of the semester. Given the intervention's goal of reducing the number of students who fail to ever complete an academic plan, analysis of this outcome measure did not take into account rates or patterns of revisions to academic plans. The completion outcome, therefore, represents whether student participants completed an academic plan at any point during the data collection period.

Academic persistence was defined as registering for at least one class in the spring semester of 2015 by February 27, 2015. This included both credit-bearing and non-credit-bearing classes.

Qualitative data collection, processing, and analysis for the implementation study

The research team intended to conduct three focus groups (one for each research group) of 8–10 students each, a focus group of 8–10 counselors, interviews with three administrators, and an interview with two support staff. Researchers also interviewed some students who were unable to attend the scheduled workshop and one-on-one focus groups. In the end, researchers were able to collect data from five workshop students (in one focus group and two individual interviews), three one-on-one students (in one focus group and one interview), one control student, eight counselors (in one focus group), three administrators, and two support staff (table B1).

Each of these activities was audio recorded, and each audio recording was later transcribed. Transcriptions were coded and analyzed according to a codebook covering topics such as the content of each session and students' attitudes and perceptions of their session. Coding took place in Dedoose, an online qualitative data analysis software.

Researchers also observed three one-on-one counseling sessions and two workshops. Notes from these activities were analyzed for patterns across sessions in each study group.

Criteria for participation in the study

To participate in the study, students had to meet the following criteria:

- Were first-time freshmen at Saddleback College.
- Had not completed an approved academic plan.
- Were enrolled in at least one credit-bearing class.
- Were not enrolled in special programs or did not have special status involving a mandatory or dedicated counseling component, such as those for student athletes or international students.
- Were not enrolled in counseling courses that include academic plan completion.

The college decided to target first-time students because members of this cohort would be the first to confront the registration block if they had completed 15 credits but did not have an academic plan by the following spring. This decision ruled out including continuing students in the study group, who, according to the college, had advising needs

Table B1. Qualitative data collection activities and number of participants, 2014/15

Activity	Number
Administrator interviews	3
Counselor focus group	8
Support staff interviews	2
Workshop focus group	5
Workshop interviews	2
One-on-one focus group	2
One-on-one interviews	1
Control interview	1

Source: Authors' records of 2014/15 data collection activities led by the South Orange County Community College District.

that could have been more complex than those of freshmen because they would have had transcripts from the college or from other colleges to account for in their academic plans.

For descriptions of the characteristics of the baseline and analytic samples of students, see tables C1 and C2 in appendix C.

Random assignment of students to the interventions and control condition

Randomization of the 1,839 students who met the initial eligibility criteria occurred in the third week of September 2014. A spreadsheet with the student IDs of these students was provided to Regional Educational Laboratory West for random assignment. The numbers of students assigned to the workshop and one-on-one groups were informed by two factors: the capacity of the college's counseling department to dedicate counselors to delivering MAP services, and requirements in the research design to have sufficient power to detect minimal detectable effects. The college decided that offering 6 workshops and 20 one-on-one sessions per week for 10 weeks was optimal, given the number of counselors who were trained and available to lead these sessions. As a result, 1,140 students were initially assigned to the workshop group, 200 students were assigned to the one-on-one group, and 499 students were assigned to the control group.

After assignment, the study team provided the district with the assignment information for all 1,839 students for entry into the district's data system. Email messages were sent to all students in the study, including general information about their enrollment in the study, instructions explaining how to opt out of the study if desired, and basic information about the MAP tool. A total of 24 students opted out of the study shortly after random assignment, mostly because they had already completed their academic plan and were therefore not eligible for the intervention. An additional 52 students were identified as ineligible during the analysis because they had completed an academic plan prior to the date of random assignment. These students were removed from the analysis sample, leaving a total of 1,763 students.

Outcome measures

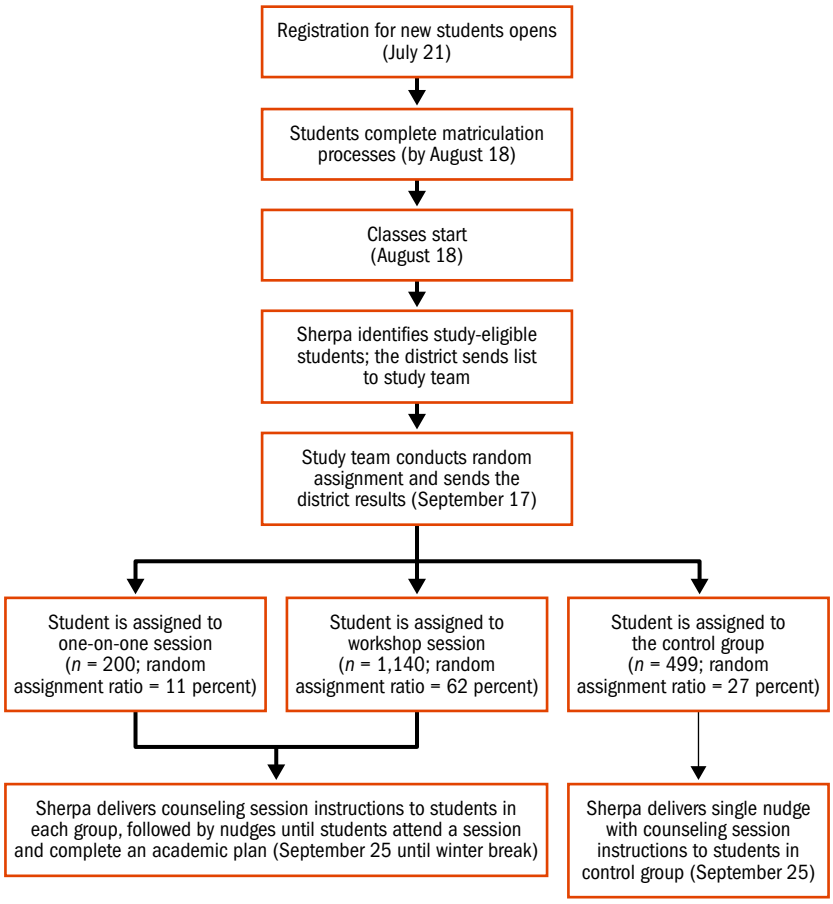
This study had four outcome measures:

- Scheduling a counseling appointment.
- Attending a counseling appointment.
- Completing an academic plan.
- Reenrolling in the semester following the intervention (academic persistence).

Analytic approach

There are two general classes of research: confirmatory and exploratory. Confirmatory research is designed to answer substantive empirical questions with a high level of confidence. To accomplish this, a confirmatory research question is clearly specified before data are collected and used to guide the analysis of study results. Confirmatory questions are usually designed to assess the validity of a program model or theory and identify which outcomes should be analyzed. The primary focus is to avoid erroneously concluding that there is a relationship when, in fact, one does not exist. Avoiding such errors requires a large enough sample of participants to ensure that it is possible to detect program effects that have practical significance.

Figure B1. Study intake chart of sampled students, 2014/15



Source: Authors' compilation.

The goal of exploratory research is to identify relationships or patterns of relationships that can form the basis for future research. Exploratory research questions are not answered with the same level of confidence as confirmatory questions and are sometimes defined after a study has been designed and the data collected. As a result, the study design and number of participants are generally not sufficient to provide definitive answers about whether there is a "true" relationship between the variables being examined. The results of exploratory analyses are therefore considered suggestive.

All impact estimates comparing the workshop group or the one-on-one group to the control group (standard services) were calculated using the following model:

$$Y_i = \alpha + \beta_1 T_{1i} + \beta_2 T_{2i} + \varepsilon_i$$

where Y_i is the outcome of interest (such as academic plan completion) for student i; α is the average outcome for students assigned to the control group; β_1 is the estimated impact of the one-on-one condition compared to the control condition; β_2 is the estimated impact of the workshop condition compared to the control condition; T_{1i} indicates whether student i was assigned to the one-on-one group; T_{2i} indicates whether student i was assigned to the workshop group; and ε_i is an error term.

Because of random assignment, β_1 and β_2 are unbiased estimates of the intent-to-treat effects for each of the two intervention groups, relative to the counterfactual of the control group. The estimated impact of the workshop condition compared to that of the one-on-one condition, and its standard errors, were calculated from the estimates associated with β_1 and β_2.

All impact estimates comparing the workshop group to the one-on-one group were calculated using the following model:

$$Y_i = \alpha + \beta_1 T_{1i} + \varepsilon_i$$

where Y_i is an outcome of interest (such as completion of an academic plan) for student i; α is the average outcome for students assigned to the one-on-one group; β_1 is the estimated impact of the workshop condition compared to the one-on-one condition; T_{1i} indicates whether student i was assigned to the workshop group; and ε_i is an error term. The standard errors for the estimated impact of the workshop condition compared to the one-on-one condition were calculated from the estimate associated with β_1.

Before the study power analyses were conducted to estimate the minimal detectable effect for the difference between the workshop group and the one-on-one group for the academic plan completion outcome. The minimal detectable effect is the smallest true impact that an experiment is likely to detect (Bloom, 1995). The smaller the minimal detectable effect, the more likely it is that a study will be able to detect impacts of a small magnitude. The minimal detectable effect (*MDE*) for a binary outcome was calculated using the following formula (from Bloom, 1995):

$$MDE = 2.80 * \sqrt{\frac{\pi(1-\pi)(1-r^2)}{T(1-T)n}}$$

where 2.80 is the appropriate multiplier for 80 percent power and a 5 percent significance level with a two-tailed hypothesis test; π is the proportion of the study population that would have a value of 1 for the binary outcome in the absence of the intervention; r^2 is the explanatory power of the impact regression (assumed to be 0); T is the proportion of the sample that is randomly assigned to the intervention group; and n is the total size of the study sample.

The minimal detectable effects for the two confirmatory research questions were calculated to compare assignment to the workshop group and assignment to the control group and to compare assignment to the one-on-one group with assignment to the control group. The district provided information to establish the baseline value for the primary outcome of interest. The district estimated that about 30 percent of students enrolled at Saddleback College in the fall of 2013 had at least started an academic plan, but only about 10 percent had completed an academic plan that had been reviewed and approved by a counselor. The power calculations assumed a 5 percent significance level, 80 percent power, a two-tailed test, and a baseline completion rate of 20 percent.

In comparisons of outcomes for students assigned to the workshop group with outcomes for those assigned to the control, the total sample size for the power analysis was estimated to

be 1,639 (1,140 students in the workshop group and 499 students in the control group). The relative probability of assignment to the workshop group was 0.70. The minimal detectable effect is 6.0 percentage points. An equivalent calculation for the one-on-one group yields a minimal detectable effect of 9.3 percentage points. The sample size for that calculation was 699 students, with a probability of assignment to the one-on-one group of 0.29.

Minimal detectable effects can also be calculated for analyses that compare outcomes for students assigned to the workshop group to outcomes for those assigned to the one-on-one group. The total sample size for that comparison was 1,340 (1,140 students in the workshop group and 200 students in the one-on-one group), and students were assigned to the workshop group with a relative probability of 0.85. This power analysis showed that with a completion rate for the one-on-one group of 20 percent, the minimal detectable effect is 8.6 percentage points.

Statistical adjustments

The number of confirmatory research questions for this study was limited to two:

- Does assignment to the workshop group increase the academic plan completion rate, compared with the control group?
- Does assignment to the one-on-one group increase the academic plan completion rate, compared with the control group?

Because these two questions fall within the same domain and are not independent of each other, the Benjamini and Hochberg (1995) method was used to adjust for multiple comparisons when testing these two hypotheses. This approach uses a stepwise method to adjust obtained *p*-values, based on the number of outcome variables within the domain and the number of hypothesis tests being conducted. The adjusted and unadjusted results are presented in table B2.

Because individual students (rather than groups of students) were randomly assigned, the main analysis did not adjust for clustering. There is disagreement over whether such adjustment is necessary with individual randomization when the intervention is delivered in groups (see, for example, Serlin, Wampold, & Levin, 2003; Siemer & Joorman, 2003a, 2003b; Weiss, Lockwood, & McCaffrey, 2014). Moreover, the data needed to associate students with unique workshops were not available, so analyses that account for clustering in the data could not be performed. Such analyses, however, are unlikely to change the

Table B2. Multiple hypothesis adjustment for confirmatory outcomes, 2014/15

	Workshop group		One-on-one group		Control group		Difference between workshop and control groups			Difference between one-on-one and control groups		
Outcome measure	Percent	Standard deviation	Percent	Standard deviation	Percent	Standard deviation	Percentage point difference	Raw *p*-value	Adjusted *p*-value	Percentage point difference	Raw *p*-value	Adjusted *p*-value
Completed an academic plan	38.2	48.6	42.0	49.5	18.8	39.1	19.5***	<.001	<.001	23.2***	<.001	<.001

*** Significant at $p < .001$.

Note: Pre-intervention, there were 1,763 students in the full analytic sample: 1,085 students in the workshop group, 193 students in the one-on-one group, and 485 students in the control group. Rounding may cause slight discrepancies in differences. *p*-values were adjusted for multiple comparisons using the Benjamini-Hochberg (1995) method.

Source: Authors' calculations using 2015 administrative data from the South Orange County Community College District.

substantive conclusions, given the large size of the estimates reported and the very small standard errors associated with those estimates. Because counselors were not randomly assigned, it is possible that the impact estimates may be affected by the effectiveness of individual counselors, rather than by the intervention itself. This also appears unlikely, however, because the estimates for attending an appointment are nearly identical to the estimates for completing an academic plan, suggesting that nudging students to attend appointments or offering guaranteed access to appointments was the main driver of the impacts.

Missing data

Students who did not have a data record for an outcome such as appointment scheduling or academic plan completion were coded as not having completed that outcome. For example, if a student was not included in the list of students who had created an academic plan, the completion data for that student was not considered to be missing; instead, the lack of data was taken as indicating that an academic plan had not been created. Similarly, students were coded as having zero academic counseling appointments if no advisement records for the student were included in the data.

The data for counseling appointment attendance included 36 students with data records but no values recorded for attendance. Attendance for those students was coded as "no" to indicate that they did not attend the scheduled appointment. Sensitivity analyses were conducted, coding the missing outcomes to missing, yes, and no, to confirm that the decision did not affect the findings for that outcome. These analyses are included in table B3.

Table B3. Sensitivity analysis for missing attendance values, 2014/15

Missing attendance code	Workshop group (percent)	One-on-one group (percent)	Control group (percent)	Difference between workshop and control groups (percentage points)	Difference between one-on-one and control groups (percentage points)	Difference between workshop and one-on-one groups (percentage points)
Attendance = no	48.2	50.3	30.1	18.1***	20.2***	–2.1
Attendance = yes	50.4	51.3	32.2	18.2***	19.1***	–0.9
Sample size (n = 1,763)	1,085	193	485	na	na	na
Attendance code is missing	49.3	50.8	30.7	18.6***	20.0***	–1.5
Sample size (n = 1,727)	1,061	191	475	na	na	na

*** Significant at $p < .001$.

na is not applicable.

Note: Rounding may cause slight discrepancies in differences. All statistical tests were conducted using the ordinary least squares regression models described in the analytic approach section of appendix B.

Source: Authors' calculations using 2015 administrative data from the South Orange County Community College District.

Appendix C. Supplemental tables

Pre-intervention sample sizes and characteristics for the baseline and analytic samples are in tables C1 and C2. Postintervention outcomes for the analytic sample and the estimated effects are in table C3. Student responses to a survey on the MAP workshop are in table C4 and figures C1, C2, and C3. Detailed data on cost per student for each counseling approach are in table C5.

Table C1. Pre-intervention sample sizes and characteristics for the baseline sample, 2014/15

Characteristic	Full sample (percent)	Workshop group (percent)	One-on-one group (percent)	Control group (percent)	Difference between workshop and control groups		Difference between one-on-one and control groups		Difference between workshop and one-on-one groups	
					Percentage points	*p*-value	Percentage points	*p*-value	Percentage points	*p*-value
Gender										
Male	51.2	49.8	49.2	54.9	–5.1	0.06	–5.7	0.18	0.6	0.88
Age										
Younger than 19 years old	70.1	70.7	68.5	69.3	1.4	0.58	–0.8	0.83	2.2	0.53
Average age (years)	21.1	20.9	21.9	21.3	–0.4	0.41	0.6	0.50	–1.0	0.19
Race/ethnicity										
Asian or Pacific Islander	6.5	7.5	4.1	5.1	2.4	0.08	–1.0	0.63	3.4	0.08
Black	1.2	1.6	0.5	0.6	0.9	0.11	–0.1	0.91	1.0	0.22
Hispanic	12.8	12.8	10.8	13.8	–1.0	0.58	–3.0	0.30	2.0	0.46
White	56.7	57.0	61.3	54.1	2.9	0.29	7.2	0.09	–4.4	0.26
Other race/multiracial	22.8	21.1	23.2	26.3	–5.2**	0.02	–3.1	0.38	–2.1	0.53
Enrollment status in fall 2014										
Full-time	48.9	49.1	45.0	49.9	–0.8	0.77	–4.9	0.24	4.1	0.29
Part-time	42.1	42.1	43.0	41.9	0.2	0.93	1.1	0.79	–0.9	0.82
New to South Orange County Community College District	82.9	84.5	80.5	80.4	4.1**	0.04	0.1	0.97	4.0	0.17
Enrolled in noncredit courses	5.2	5.4	5.5	4.6	0.8	0.52	0.9	0.63	–0.1	0.94
Not enrolled[a]	3.8	3.4	6.5	3.6	–0.2	0.84	2.9	0.07	–3.1	0.04
Main reason for enrolling in college[b]										
Complete a certificate program	2.1	1.9	0.5	3.4	–1.5*	0.05	–2.9**	0.02	1.4	0.21
Obtain an associate's degree	55.5	55.4	59.0	54.3	1.1	0.69	4.7	0.26	–3.6	0.34
Transfer to a four-year college/university	66.4	64.9	69.5	68.7	–3.9	0.13	0.8	0.85	–4.6	0.20
Obtain/update job skills	5.3	5.8	4.5	4.6	1.2	0.32	–0.1	0.95	1.3	0.44
Other	20.6	21.1	19.5	19.6	1.5	0.49	–0.1	0.97	1.6	0.60
Diplomas/degrees earned										
High school diploma	84.8	85.8	83.0	83.2	2.7	0.17	–0.2	0.96	2.8	0.30
General Educational Development certificate	3.7	3.0	5.0	4.8	–1.9	0.07	0.2	0.90	–2.0	0.16
Other secondary credential	8.0	8.1	8.5	7.8	0.2	0.87	0.7	0.76	–0.4	0.84
None of the above	3.5	3.1	3.5	4.2	–1.1	0.28	–0.7	0.64	–0.4	0.80
Date of high school graduation/receipt of General Educational Development certificate										
During the past year	83.0	83.8	80.0	82.5	1.3	0.52	–2.5	0.44	3.8	0.20
1–5 years ago	6.9	6.5	6.8	7.6	–1.0	0.45	–0.8	0.73	–0.3	0.88
6–10 years ago	2.9	2.9	3.7	2.5	0.4	0.69	1.2	0.42	–0.8	0.55
More than 10 years ago	7.2	6.7	9.5	7.4	–0.6	0.65	2.1	0.35	–2.7	0.18

* Significant at $p < .05$; ** significant at $p < .01$.

Note: Pre-intervention, there were 1,815 students in the full baseline sample: 1,116 students in the workshop group, 200 students in the one-on-one group, and 499 students in the control group. Rounding may cause slight discrepancies in differences. Missing values are included only in variable distributions for characteristics with more than 5 percent of the sample missing.

a. Not-enrolled students withdrew from all courses in which they enrolled in fall 2014 prior to the census date.

b. Responses are not mutually exclusive.

Source: Authors' calculations using administrative data from the South Orange County Community College District, 2015.

Table C2. Pre-intervention student characteristics for the analytic sample, 2014/15

Characteristic	Full sample (percent)	Workshop group (percent)	One-on-one group (percent)	Control group (percent)	Difference between workshop and control groups		Difference between one-on-one and control groups		Difference between workshop and one-on-one groups	
					Percentage points	*p*-value	Percentage points	*p*-value	Percentage points	*p*-value
Gender										
Male	51.2	50.0	48.4	54.9	−4.9	0.08	−6.5	0.13	1.6	0.68
Age										
Younger than 19 years old	69.9	70.5	68.4	69.3	1.2	0.62	−0.9	0.82	2.1	0.56
Average age (years)	21.1	20.9	21.9	21.4	−0.5	0.35	0.5	0.52	−1.0	0.17
Race/ethnicity										
Asian or Pacific Islander	6.5	7.6	4.3	5.1	2.5	0.07	−0.8	0.71	3.3	0.09
Black	1.2	1.6	0.5	0.6	1.0	0.11	−0.1	0.92	1.1	0.22
Hispanic	12.7	12.8	10.2	13.6	−0.8	0.67	−3.4	0.24	2.6	0.32
White	56.8	57.0	62.0	54.4	2.5	0.36	7.6	0.08	−5.1	0.20
Other race/multiracial	22.7	21.1	23.0	26.3	−5.2**	0.03	−3.3	0.37	−1.9	0.57
Enrollment status in fall 2014										
Full-time	48.6	48.6	45.1	50.1	−1.5	0.58	−5.0	0.24	3.5	0.37
Part-time	42.2	42.4	42.5	41.6	0.7	0.78	0.8	0.84	−0.1	0.98
New to South Orange County Community College District	5.3	5.5	5.7	4.7	0.8	0.52	1.0	0.62	−0.2	0.92
Enrolled in noncredit courses	3.9	3.5	6.7	3.5	0.0	1.00	3.2	0.05	−3.2	0.03
Not enrolled[a]	83.4	85.1	80.8	80.8	4.2**	0.04	0.0	1.00	4.2	0.14
Main reason for enrolling in college[b]										
Complete a certificate program	2.0	1.8	0.5	3.3	−1.5*	0.05	−2.8	0.02	1.2	0.26
Obtain an associate's degree	55.1	55.0	58.0	54.0	1.0	0.71	4.0	0.34	−3.0	0.44
Transfer to a four-year college/university	66.0	64.5	68.9	68.2	−3.7	0.15	0.7	0.87	−4.4	0.24
Obtain/update job skills	5.5	6.0	4.7	4.7	1.2	0.32	−0.1	0.97	1.3	0.46
Other	21.0	21.7	20.2	20.0	1.7	0.46	0.2	0.95	1.5	0.65
Diplomas/degrees earned										
High school diploma	84.6	85.5	82.9	83.1	2.4	0.22	−0.2	0.95	2.6	0.35
General Educational Development certificate	3.8	3.0	5.2	4.9	−1.9	0.07	0.2	0.89	−2.1	0.15
Other secondary credential	8.2	8.2	8.3	8.0	0.2	0.91	0.2	0.92	−0.1	0.97
None of the above	3.5	3.2	3.6	3.9	−0.7	0.49	−0.3	0.85	−0.4	0.78
Date of high school graduation/receipt of General Educational Development certificate										
During the past year	82.9	83.6	80.3	82.3	1.4	0.52	−1.9	0.56	3.3	0.28
1–5 years ago	7.0	6.6	7.1	7.6	−0.9	0.51	−0.5	0.83	−0.5	0.82
6–10 years ago	2.9	3.0	2.7	2.6	0.4	0.68	0.1	0.93	0.3	0.85
More than 10 years ago	7.3	6.7	9.8	7.6	−0.8	0.57	2.3	0.32	−3.1	0.14

* Significant at $p < .05$; ** significant at $p < .01$.

Note: Pre-intervention, there were 1,763 students in the full analytic sample: 1,085 students in the workshop group, 193 students in the one-on-one group, and 485 in the control group. Rounding may cause slight discrepancies in differences. Missing values are included only in variable distributions for characteristics with more than 5 percent of the sample missing.

a. Not-enrolled students withdrew from all courses in which they enrolled in fall 2014 prior to the census date.

b. Responses are not mutually exclusive.

Source: Authors' calculations using 2015 administrative data from the South Orange County Community College District.

Table C3. Postintervention outcomes for the analytic sample and estimated effects, 2015

Outcome measure	Workshop group		One-on-one group		Control group		Difference between workshop and control groups		Difference between one-on-one and control groups		Difference between workshop and one-on-one groups	
	Percent	Standard deviation	Percent	Standard deviation	Percent	Standard deviation	Percentage points	*p*-value	Percentage points	*p*-value	Percentage points	*p*-value
Student scheduled counseling appointment	56.4	49.6	58.5	49.4	32.6	46.9	23.8***	<.001	26.0***	<.001	–2.1	0.6
Student attended counseling appointment	48.2	50.0	50.3	50.1	30.1	45.9	18.1***	<.001	20.2***	<.001	–2.1	0.6
Student completed an academic plan	38.2	48.6	42.0	49.5	18.8	39.1	19.5***	<.001	23.2***	<.001	–3.7	0.3
Student enrolled in spring 2015	77.8	41.6	77.2	42.1	79.8	40.2	–2.0	0.4	–2.6	0.5	0.6	0.9

*** Significant at $p < .001$.

Note: Pre-intervention, there were 1,763 students in the full analytic sample: 1,085 students in the workshop group, 193 students in the one-on-one group, and 485 in the control group. Rounding may cause slight discrepancies in differences. All statistical tests were conducted using ordinary least squares regression models. See appendix B for more details.

Source: Authors' calculations using 2015 administrative data from the South Orange County Community College District.

Table C4. Student responses to workshop survey, 2015 (percent)

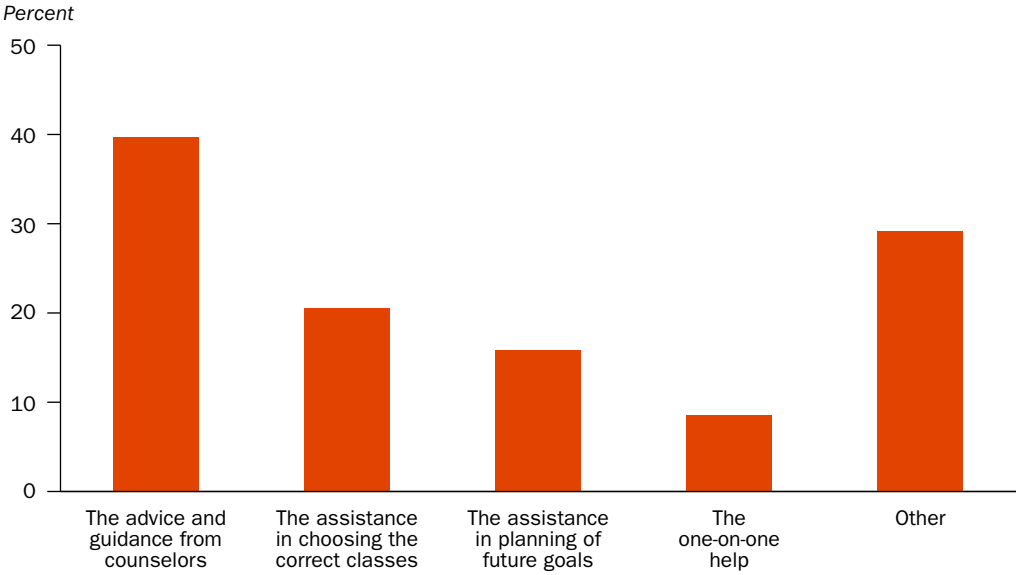
Statement	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree	Did not answer	Total number of respondents
This workshop met my academic planning needs.	47.8	36.2	13.5	0.6	1.2	0.6	163
My plan is to use this MAP in order to reach my education goal while at Saddleback College.	57.6	31.3	8.6	0.6	0.6	1.2	163
I was satisfied with the workshop.	55.8	30.1	9.2	3.1	1.2	0.6	163

MAP is an academic plan created using the My Academic Plan tool.

Note: Results from this survey should be viewed with caution. The survey data may include responses from some nonstudy students who had previously attended a MAP group session that was not associated with the study (although, according to the counselors, nonstudy group sessions were conducted in the same manner as the study workshops). Rounding may cause slight discrepancies in sums and differences.

Source: Authors' calculations using 2015 administrative data from the South Orange County Community College District.

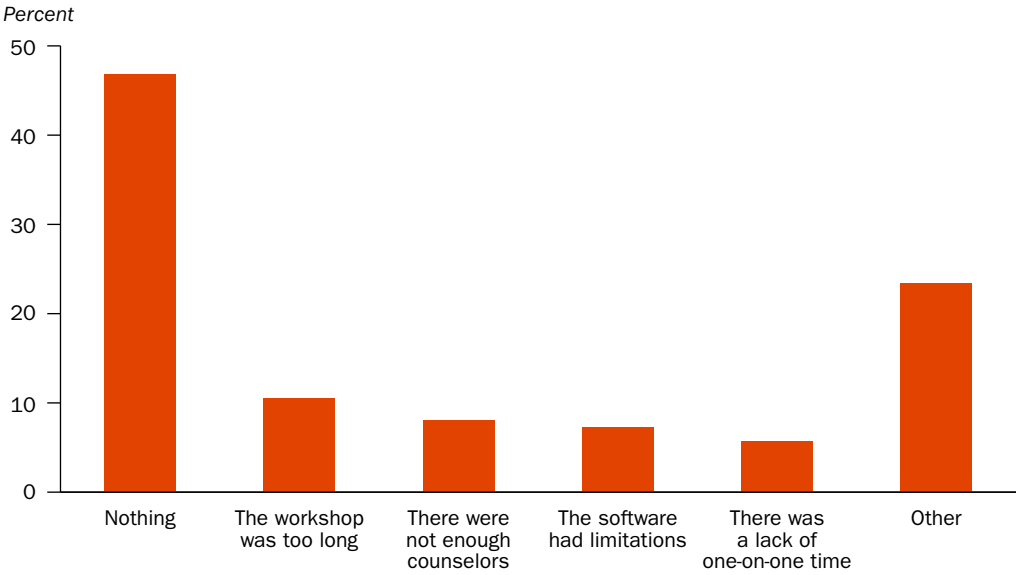
Figure C1. Student responses to workshop survey (What did you like/find helpful about the workshop?), 2014/15



Note: *n* = 151. Results from this survey should be viewed with caution. According to counseling staff, the survey data may include responses from some nonstudy students who had previously attended a My Academic Plan group session that was not associated with the study (although, according to the counselors, nonstudy group sessions were conducted in the same manner as the study workshops). Response categories were derived from an analysis of open-ended survey responses.

Source: Authors' calculations using 2015 administrative data from Saddleback College.

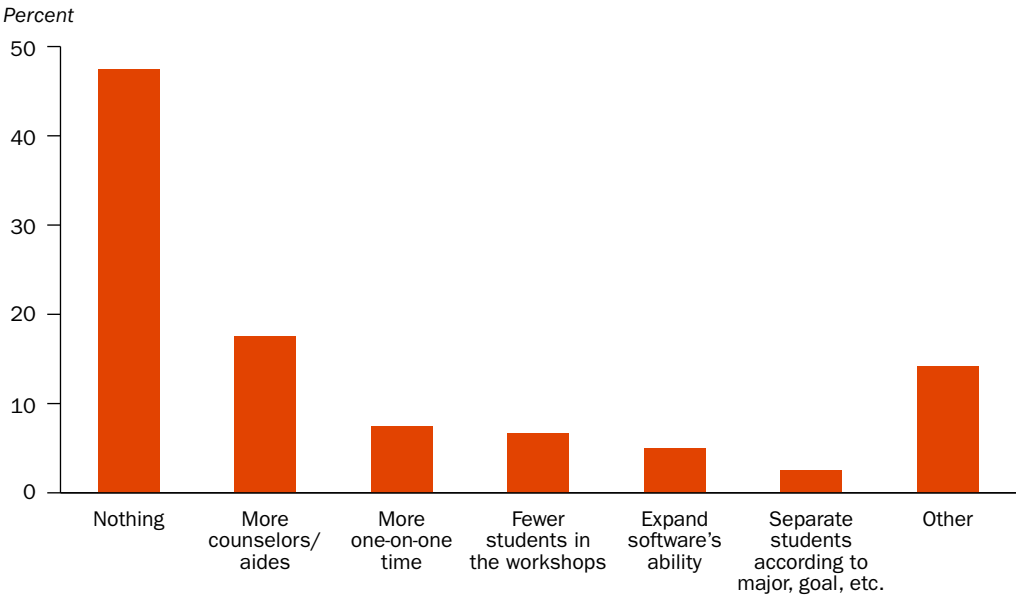
Figure C2. Student responses to workshop survey (What did you not like/not find helpful about the workshop?), 2014/15



Note: *n* = 151. Results from this survey should be viewed with caution. The survey data may include responses from some nonstudy students who had previously attended a My Academic Plan group session that was not associated with the study (although, according to the counselors, nonstudy group sessions were conducted in the same manner as the study workshops). Response categories were derived from an analysis of open-ended survey responses.

Source: Authors' calculations using 2015 administrative data from Saddleback College.

Figure C3. Student responses to workshop survey (How could we improve the workshop?), 2015



Note: *n* = 151. Results from this survey should be viewed with caution. The survey data may include responses from some nonstudy students who had previously attended a My Academic Plan group session that was not associated with the study (although, according to the counselors, nonstudy group sessions were conducted in the same manner as the study workshops). Response categories were derived from an analysis of open-ended survey responses.

Source: Authors' calculations using 2015 administrative data from Saddleback College.

Table C5. Average per student cost by component for each counseling approach, 2014/15 ($)

Component	Workshop group	One-on-one group	Control group
Cost per student	27	46	24
Counselor time in session	11	35	20
Counselor time in training	0	2	1
Computer lab	9	0	0
Administrative staff time to support training	0[a]	2	1
Nudges (emails and texts)	1	1	0
Robocalls	1	1	0
Administrative staff time to support scheduling of sessions	4	5	3
Alternative cost per study student (with all full-time staff)[b]	34	53	28
Sample size (number)	1,085	193	485

Note: Costs are driven by the number of counseling sessions scheduled by students in the respective study groups. If a student fails to attend a scheduled session, the analysis assumes that the cost associated with the session is still realized. The average hourly rate for a typical counselor in each group is based on the fraction of counselors that were full-time compared to part-time. The cost of computers needed for the workshops is based on 19 computers at $500 each. The cost of the Sherpa tool is considered part of the base college services. Therefore it is not associated with an incremental cost across the three groups. If another college was considering this intervention but lacked such a counseling support system the cost of such a system would need to be considered.

a. Unrounded value is 0.31.

b. The sensitivity adjustment is included to communicate the role different compensation rates associated with full-time and adjunct counselors play in the cost of each modality. The alternative describes the cost assuming all counselors are full-time staff and that full-time counselors cost 74 percent more than adjuncts. Specifically, it assumes the annual cost of salary and benefits for a full-time counselor is $139,200 ($120,000 salary plus 16 percent for benefits) compared with $80,000 for adjuncts ($80,000 salary and no benefits).

Source: Cost estimates are based on study team calculations from program expenditure data for the intervention semesters (fall 2014 and spring 2015) as reported to Regional Educational Laboratory West by Saddleback College and research on full-time and adjunct counselor salaries as reported by the California State Controller's Office for the same time period.

Appendix D. Descriptions of MySite, Sherpa, and My Academic Plan systems

This appendix includes descriptions of MySite, Sherpa, and the My Academic Plan (MAP) system.[7]

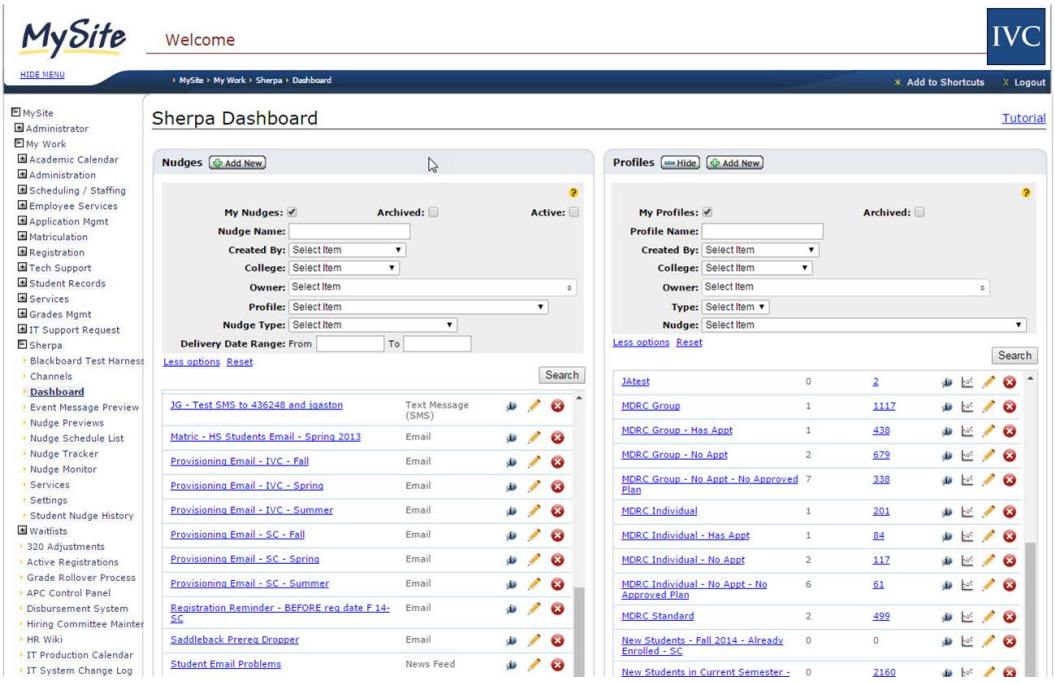
MySite

MySite is a web portal used by students, faculty, staff, and administrators within the South Orange County Community College District. It was developed in-house by the district's technical staff and delivers all of the districtwide online services used by Saddleback College and Irvine Valley College.

Sherpa

Sherpa is a proactive and interactive recommendation engine developed entirely by district technical staff to enhance student success. The Sherpa system generates intelligent, automated computer recommendations (similar to those used by companies such as eBay, Netflix, Amazon, Pandora, and Apple) to assist students in making well-informed decisions and engaging in behaviors that are likely to improve their chances of success. An image of the Sherpa dashboard is shown in figure D1. Sherpa delivers "just-in-time" information, using time-, event-, or data-based triggers to deliver reminders and recommendations—called "nudges"—through a feed on the student web portal (MySite), email, text messages, text-to-speech audio, or a mobile phone application. Images of nudges on the Sherpa website are shown in figures D2 and D3. Nudges can encourage students to find acceptable alternatives when their preferred courses are full, target at-risk students for academic interventions, tailor information about campus events to individual interests and needs, and (for this study) encourage students to complete an academic plan. Fully integrated with the

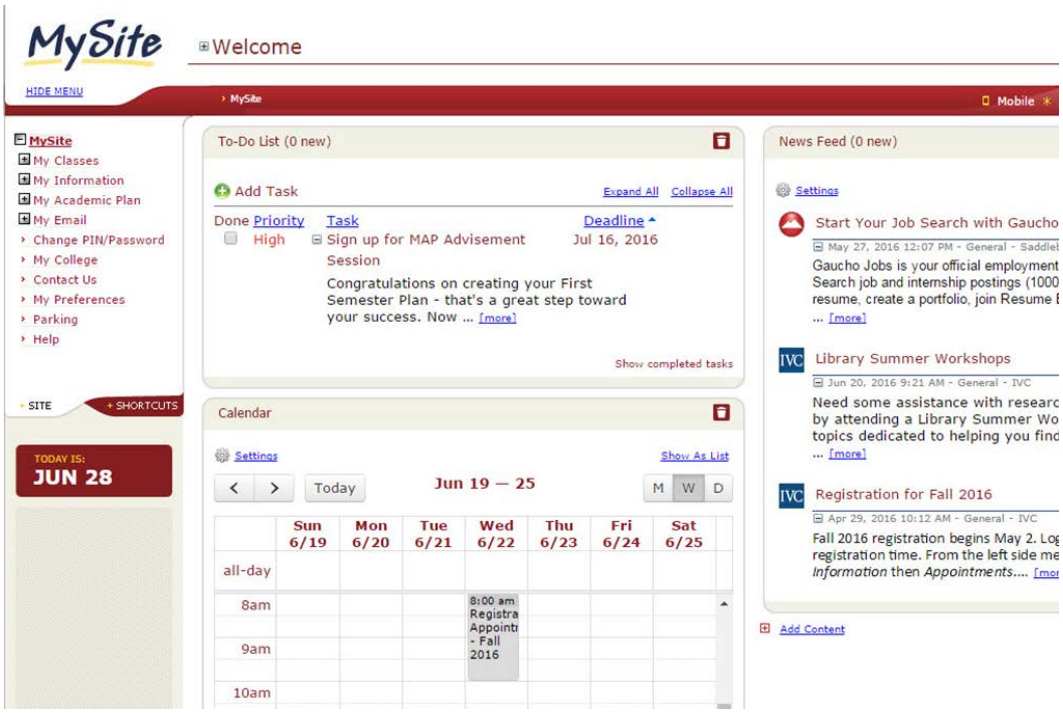
Figure D1. Sherpa dashboard



Note: Used by authorized college staff to create profiles and nudges.

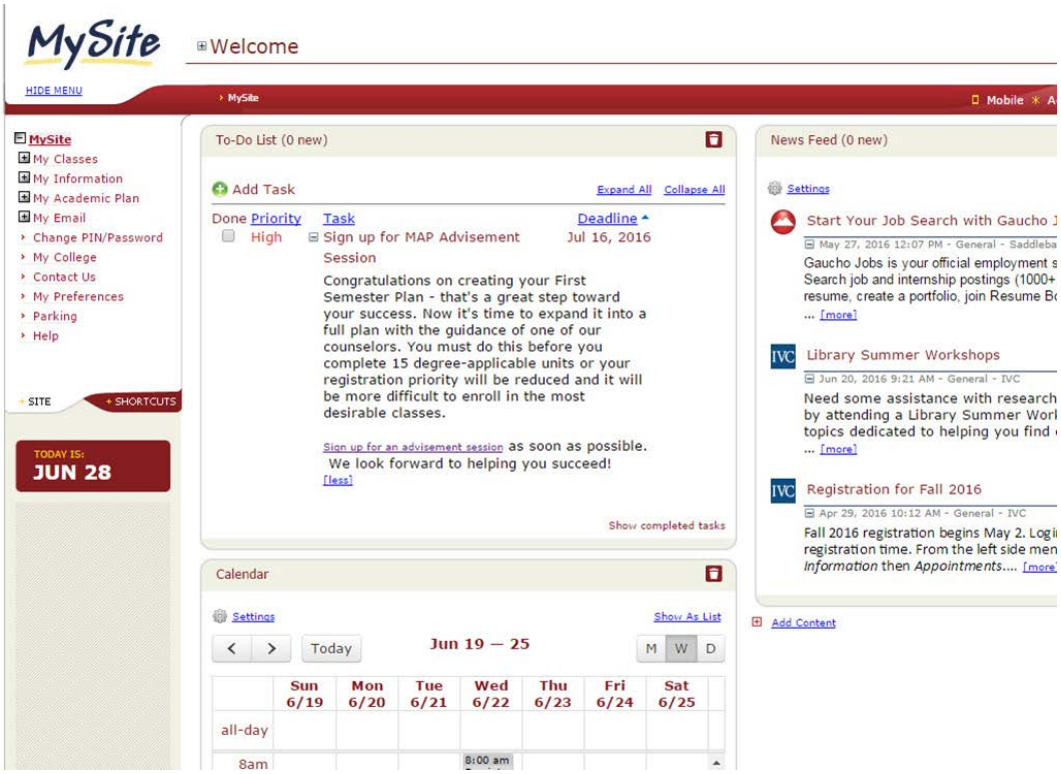
Source: Saddleback College website, https://mysite.socccd.edu/Portal/MySite/Sherpa/Dashboard.aspx.

Figure D2. MySite To-Do List item (or nudge)



Source: Saddleback College website, https://mysite.socccd.edu/Portal/MySite/Default.aspx.

Figure D3. MySite To-Do List item (or nudge) with detail



Source: Saddleback College website, https://mysite.socccd.edu/Portal/MySite/Default.aspx.

district's student information system, the district's home-built student records management system, MySite, and MAP, Sherpa makes these personalized recommendations through the use of profiles that describe sets of students with common characteristics.

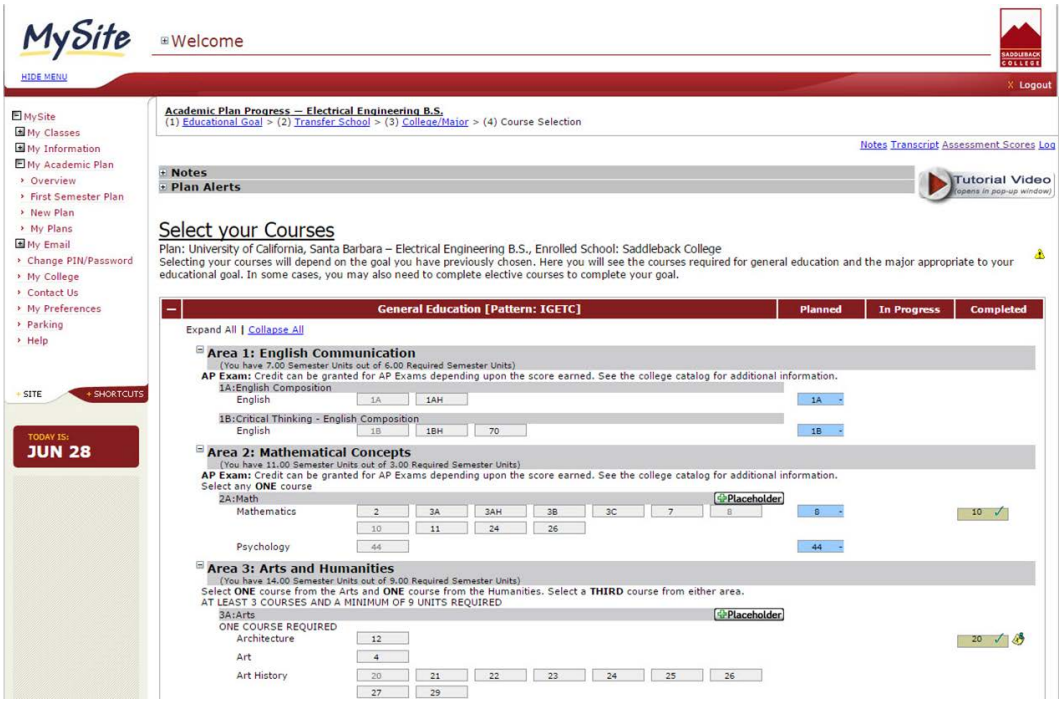
My Academic Plan

MAP is among the many tools that students see when they log on to their personal MySite. An interactive program that helps students select an education goal, choose a major, and identify the courses that they need to satisfy the requirements of that major, MAP is tightly integrated with MySite, Sherpa, the online class schedule, and Project ASSIST (Articulation System Stimulating Interinstitutional Student Transfer), a statewide articulation database that includes every transferable course offered by every community college in the state.

When students log on to MySite and select their intended education goals and programs of study or their major, they immediately see a list of both required courses and elective options. The list is also personalized. For example, if a student's placement test score requires him or her to take a developmental education course in mathematics or reading, that course will pre-populate the schedule. Students can select and add courses from a list of courses designated as general education requirements, major/program requirements, electives, prerequisites/corequisites, or courses that are not applicable to the selected education goal. Students' choices are then automatically arrayed in a semester-by-semester plan, leading to the desired credential in the amount of time specified by the student.

The MAP system was developed by the information technology team at the district and was launched in 2007 after soliciting input from counselors and students. MAP is similar enough to other academic planning tools that the results of this study would be applicable in other settings (see figure D4).

Figure D4. Desktop view of My Academic Plan tool



Source: Saddleback College website, https://mysite.socccd.edu/Portal/MAP/Wizard/CourseSelection.aspx.

Notes

1. The median was 5 and there were two modes: 2 and 8.
2. Results from this survey should be interpreted with caution because the survey was not consistently offered and because it includes responses from up to five students who were not included in the study but attended a workshop session that was not associated with the study (although, according to counselors, nonstudy workshop sessions were conducted in the same manner as the study workshops). For these reasons, a response rate calculation is included.
3. Counselors' opinions and concerns were observed directly by the research team during focus groups and interviews (see appendix B).
4. The study was designed to detect differences of about 8.6 percentage points or larger between the workshop and the one-on-one groups. If the true difference is smaller, the study would be unable to detect it and differences could be undetected as a result. See discussion of statistical power in appendix B for details.
5. To learn more about the online system used at Saddleback College, contact the district's director of information technology (Academic Systems) at jgaston@socccd.edu or see https://www.socccd.edu/technologyandlearning/tl_projects_student.html.
6. The design allowed for 1,140 workshop slots and 200 one-on-one session slots.
7. More information on each of these tools can be found at https://www.socccd.edu/technologyandlearning/tl_projects_student.html.

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