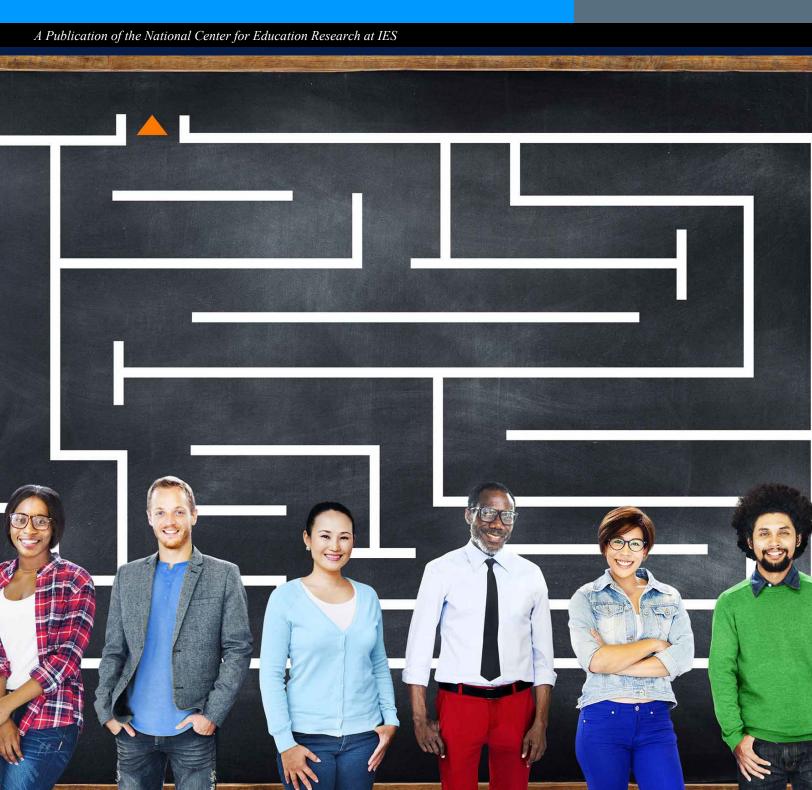IES Institute of Education Sciences

Information and Advising: Helping Students Navigate Postsecondary Education

Technical Working Group Summary | July 26, 2019

U.S. DEPARTMENT OF EDUCATION

Information and Advising: Helping Students Navigate Postsecondary Education

Technical Working Group (TWG) Meeting

July 26, 2019

National Center for Education Research
Institute of Education Sciences
U.S. Department of Education
Washington, DC

Table of Contents

Technical Working Group Members

Invited Experts

Christopher Avery, Professor of Public Policy
Harvard University

Beth Bean, Vice President for National Engagement, Philanthropy, and Policy
Strada Education Network

Eric Bettinger, Associate Professor of Economics
Stanford Graduate School of Education

Jerel Booker, Assistant Commissioner for College Readiness and Success
Texas Higher Education Coordinating Board

Catherine Finnegan, Assistant Vice Chancellor for Institutional Effectiveness
Virginia's Community Colleges

Mei-Yen Ireland, Program Officer
Bill & Melinda Gates Foundation

Jennifer Keup, Director - National Resource Center for The First-Year Experience and
Students in Transition
University of South Carolina

Hana Lahr, Senior Research Associate - Community College Research Center
Teachers College, Columbia University

Alex Mayer, Deputy Director
MDRC

Trey Miller, Principal Researcher
American Institutes for Research

Joe O'Shea, Assistant Provost and Assistant Vice President for Academic Affairs
Florida State University

Philip Oreopoulos, Professor of Economics and Public Policy
University of Toronto

Lindsay Page, Associate Professor
University of Pittsburgh

Lashawn Richburg-Hayes, Vice President
Insight Policy Research

Institute of Education Sciences Staff

Mark Schneider, Director
Institute of Education Sciences

Elizabeth Albro, Commissioner
National Center for Education Research

Matthew Soldner, Commissioner
National Center for Education Evaluation and Regional Assistance

Allen Ruby, Associate Commissioner of Policy and Systems
National Center for Education Research

Marsha Silverberg, Associate Commissioner
National Center for Education Evaluation and Regional Assistance

James Benson, Program Officer – Postsecondary Education
National Center for Education Research

Introduction

The college pipeline from start to finish is an extraordinarily complex process with numerous decision points, options, and obstacles. Students from advantaged social backgrounds are more likely than their low-income peers to attend schools and colleges staffed with advisers and support staff that have time and resources to assist them at challenging junctures. They may also draw on relationships with family, adults in their communities, or knowledgeable peers for assistance in making navigation decisions. For students without such supports, the "choice architecture," (Thaler & Sunstein, 2008) may become so overwhelming that they respond to it by delaying decisions or making poor choices that lead to sizable delays in their progression to degree. And as delays and mistakes accrue, many students decide to leave college entirely. For these reasons postsecondary researchers have turned their attention to helping students navigate the college pipeline.

While researchers and college administrators generally agree that high-quality advising can help students with navigational challenges, they are also aware of the substantial expenditures required to drive down student-to-adviser ratios. Also, through research and direct interactions with students, they are aware of the proliferation of communication platforms within which students send and receive information. Thus, over the last 10 years researchers and administrators have sought to develop and test information and advising strategies that rely upon larger portions of technology relative to direct human contact. On one end of the technology-contact spectrum, strategies such as one-way text-messaging rely primarily on carefully constructed text messages to nudge students to carry out crucial college-going tasks. On the other end of the spectrum, high school advisers employ simple text messages to reach out to students and schedule in-person meetings with them. In the middle are technology-enabled advising strategies that leverage data sources and communication platforms to target students with a mix of automated and face-to-face communications.

Although technology-centered strategies have shown promise for improving short-term outcomes in small experimental studies, these results have often not generalized when taken to scale. Moreover, little research has addressed key questions regarding effective mixtures of technology and face-to-face advising as well as feasible strategies for scaling enhanced information and advising strategies within colleges and postsecondary systems.

On July 26, 2019, the National Center for Education Research (NCER) of the Institute of Education Sciences (IES) convened a group of experts to discuss the current state of the field of research and practice for helping students navigate through postsecondary education. The decision to convene the TWG reflects IES's commitment to investing in research that identifies effective strategies for assisting the broad population of postsecondary students as they make their way through a sequence of stages from application to degree completion. The Panel Discussion centered on four topic areas:

1. **A framework for college attainment**: modeling information and advising within the larger set of supports for students throughout the college attainment process.
2. **Nudges and light-touch strategies**: strengths and weaknesses of technology-centered means of delivering information such as text messaging and chat bots.
3. **Intensive engagement**: strengths and weaknesses of directly engaging students through advising, coaching, and mentoring.
4. **Hybrid and Comprehensive strategies**: the potential for combining technology-centered and direct engagement strategies, and of combining multiple intervention strategies.

Each session began with an invited presentation on results from current or recently funded postsecondary research followed by an open panel discussion. The meeting concluded with each participant offering his or her primary recommendations to IES.

This document summarizes each session within the meeting and intends to accurately chronicle the main presentation and discussion points without gauging the extent of consensus or disagreement on each point. Each of the presenters as well as IES staff in attendance have reviewed the document for accuracy.

Motivation for and Organization of the Meeting
James Benson; National Center for Education Research

Dr. Benson outlined the following main objectives for the meeting:

1. To make sense of null findings from recent research on light-touch postsecondary interventions.
2. To consider the benefits and costs of a range of information and advising strategies from light-tough strategies that rely primarily on technology to more intensive strategies that include direct human interaction and additional supports.
3. To make recommendations for future research.

Dr. Benson noted that findings from evaluations of light-touch informational interventions show inconsistent impacts, with some findings indicating null impacts. For example, in an initial evaluation the Expanding College Opportunity intervention increased the rate at which high-achieving, low-income students enrolled in "peer" postsecondary institutions with competitive graduation rates and instructional spending (Hoxby & Turner, 2013). However, a recent evaluation of a similar, scaled version of the intervention by College Board did not replicate the initial improvements in college enrollment quality (Gurantz et al., 2019). In the H&R Block FAFSA Experiment, the information-only arm did not improve student outcomes, whereas the FAFSA assistance treatment—which provided direct assistance to students or their parents in filing the FAFSA—produced substantial increases in FAFSA submission, college attendance, Pell Grant receipt, and subsequent persistence. (Bettinger et al., 2018).

Although nudging has produced significant impacts on relatively contained objectives such as reducing "summer melt" (Castleman & Page, 2015b), recent results from IES-funded evaluations have not been promising. An IES-funded evaluation of financial aid nudges[1]—delivered to students via text messages encouraging FAFSA resubmission—shows that the nudges led some students to resubmit their FAFSA earlier but did not increase the overall rate of FAFSA resubmission, the average amount of financial aid, or the length of enrollment (Page et al., 2019). The IES-funded evaluation of the Digital Messaging to Improve College Enrollment and Success intervention[2]—a college enrollment intervention delivered by text message with the offer of two-way text advising—shows no significant increases in SAT taking, FAFSA submission, or enrollment (Avery et al., 2020). Moreover, evaluations of nudging interventions have yet to demonstrate positive impacts on degree completion (the long-term outcome that we care about the most).

Results from evaluations of interventions that more intensively engage students are more promising than nudging findings. An evaluation of the InsideTrack intervention, which provides intensive, individualized coaching to students with associate and bachelor's degree intentions, demonstrates significant positive impacts on progression through the second year of college as well as degree completion (Bettinger & Baker, 2014). An IES-funded evaluation of the SOURCE intervention,[3] a near-peer pre-college advising program for low-income college-ready students in the Los Angeles Unified School District found significant increases in college enrollment and attendance at selective institutions for students offered the program (Bos et al., 2012). However, the lower-cost virtual form of the intervention, implemented in the same district for the same student population, produced no meaningful impacts on student outcomes overall or for any subgroup (Phillips & Reber, 2019).

Looking across postsecondary intervention strategies, Dr. Benson noted examples of comprehensive intervention strategies producing meaningful gains in key outcomes, including the Accelerated Study in Associate Programs (ASAP) program which produced large initial gains in degree completion and continued enrollment in the initial evaluation that followed students for 3 years, and continues to show significant impacts at 6 years from program entry (Weiss et al., 2019); and the Early College High School model, which significantly increased college completion rates in an evaluation of students in high schools dispersed across five states (Song & Zeiser, 2019).

---

[1] This evaluation is funded through grant R305A160400.
[2] This evaluation was funded through grant R305A140121.
[3] This evaluation was funded through grant R305F05274.

Session 1: Modeling Information and Advising within the College Attainment Process

Introductory Presentation: Introducing a Postsecondary Attainment Model
Dr. Trey Miller and Dr. Amy Feygin (American Institutes of Research)

Dr. Miller provided an overview of the IES-funded College Completion Network, which brings together research teams focused on postsecondary student success strategies to share ideas, build new knowledge, conduct rigorous research, and disseminate their findings. The network lead coordinates these efforts and conducts research with input from the teams. This research will include a synthesis of findings from NCER-funded postsecondary research as well as a "gap analysis" study that is currently underway. The gap analysis draws on two component studies to identify gaps between completion-oriented research evidence and practices: (1) a systematic review of evidence from quantitative evaluations of community college policies, practices, and programs on student outcomes; and (2) a qualitative scan of policies, practices, and programs that community colleges use to improve student outcomes.

In developing their approach to conducting the gap analysis, the lead team—with input from network members—elaborated a framework for community college student success (see Figure 1). The framework represents as rows the key functional areas that drive student success: information about students (row 1), information and advising (row 2), academic and nonacademic supports (row 3), integrated certificate and degree programs/pathways (row 4), and curriculum and instruction (row 5). The framework represents as columns the key stages that students move through on their way from college entry to labor market entry, as follows: entry (column 1); progress (column 2); completion (column 3); and labor market entry (column 4). To highlight the strong linkages between advising and other supports, the diagram groups these two functional areas together. All functional areas serve to support the operation of integrated certificate and degree programs or pathways (row 4), which extend through all stages and terminate in academic and labor market success (column 5).

The framework can be used to break interventions into specific tasks and functions and characterize them according to whether they comprise multiple functional areas. Some "isolated interventions" (Bailey, Jaggers, & Jenkins, 2015) like tutoring are housed solely within a single functional area. Research suggests that although they are helpful, isolated interventions rarely move the needle on completion on their own (ibid). More comprehensive interventions like the Integrated Planning and Advising for Student Success (iPASS) initiative or Guided Pathways (ibid) include the implementation of a range of strategies that involve cooperation and coordination between several or all functional areas. The overall quality of an intervention depends on the quality of its components and the linkages between them. Institutions may seek to drive improvements in student outcomes by improving individual strategies they have in place and increasing integration between them.

Dr. Miller noted that the framework borrows from Completion by Design's Loss/Momentum Framework, which depicts how different types of polices, practices, and programs have the potential to influence student experiences at different points in time across students' trajectories through college, from application to completion (Rassen, Chaplot, Jenkins, & Johnstone, 2013). Many interventions target a specific phase in students' trajectories through college, such as interventions at the entry stage that aim to decrease summer "melt" (Castleman & Page, 2015a) by nudging students who have been accepted to college to show up and begin attending classes. Other interventions such as iPASS address more than one phase and adapt to students' changing advising needs as they progress through college.

Finally, Dr. Miller noted that context and policy play an important role in determining the processes and interventions that institutions implement to support student success. Contextual factors, like the population from which an institution draws its students or the resources available to it, will shape the types of processes and interventions that an institution decides to implement to support student success. For example, an institution with a large proportion of financially disadvantaged students may prioritize the provision of nonacademic supports and targeted financial aid over other interventions. Similarly, policies that are set outside of the institution's control may alter the set of possible interventions as well as incentives for implementing them. Although policy and context are important factors, they are not captured directly within the framework.

Figure 1. Framework for College Student Success

Panel Discussion

The panel provided comments on the framework and the current context of advising within campus support systems. They also discussed implications for research in the arena of information and advising.

Framework for community college student success

Panelists agreed that pathways through college are often not linear. Students may stop and start their progress several times. Older students may enter after many years of employment. Some panelists felt that the presented framework does not capture the fact that progress is often non-linear and may happen over many years. In addition, some felt that the framework should include arrows upward from academic and non-academic supports (row 3) to advising (row 2) and should not consider academic advising as separate from other student supports.

Panelists discussed that it may be useful to tailor supports and interventions for students at specific milestones captured in the framework. For example, interventions should address

the "last mile" problem (getting students from Progress to Completion). Looking at institutions with exemplary student supports, such as the [Aspen Prize](#) winners, could help researchers to identify promising strategies for moving students to completion. Panelists also suggested that analytic frameworks should consider students' post-graduation goals in operationalizing success and noted that launching from college to employment is a distinct phase of advancement (column 4). Some interventions target this phase specifically.

The current context of advising

Advising is the most-commonly-offered intervention, and its design varies across campuses. One panelist noted that it is often disconnected from other types of support, while another pointed to systems designed so that all staff serve as advisers. In some locations, advising is moving toward a model of service for students within an area of study, rather than a general drop-in model for all students. This type of "caseload advising" allows more intentional connection with students and may improve responses to early alerts and nudging. Panel members noted difficulty in isolating components of advising for the purposes of evaluation and replication.

Panelists also noted that the level of institutional support for advising affects salary levels and staff turnover, which can affect advising quality. Advising can be an entry-level, low-wage job, but career ladders can provide an alternative. However, it is challenging to restructure institutions to require advisers to be more experienced with higher salaries. It is also challenging to change advisers' mindsets and expectations about their performance.

Implications for research

Panelists discussed how the current context of advising affects carrying out high-quality causal research. In instances where all staff serve as advisers, researchers will have difficulty in identifying control groups and measuring service contrast when assessing advising interventions. When assessing intervention impacts, researchers should consider whether participation in advising is voluntary or required. In addition, analysts should consider students' motivations for participating in advising, and account for the reality that students' decisions are often driven by their need for financial aid. Knowing about students' financial needs can inform the design of successful advising interventions. Integration of financial aid, advising, and other supports is critical for college success, and research frameworks should reflect this.

Session 2: Nudges and Light-touch Informational Interventions

Introductory presentation #1: The Remarkable Unresponsiveness of College Students to Nudging and What We Can Learn from It
Philip Oreopoulos, University of Toronto

Dr. Oreopoulos presented highlights of results from a series of evaluations of light-touch interventions that he conducted over the period 2014-2018 among first-year economics students at University of Toronto. The evaluations used an experimental design to test a set of light-touch intervention strategies that had shown promise in prior trials including goal setting and mindset exercises, online coaching alone, online coaching with one-way texting, online coaching with two-way texting, and online and face-to-face coaching together. Students in the control group took an online personality test. Although the mindset intervention was associated with a small improvement in first-semester grades, none of the light-touch intervention strategies resulted in substantively meaningful improvements to academic progress (credit attainment and persistence) through the third year of college,[4] even among students more at risk of poor academic performance.

The primary exception to the overall null findings comes from an evaluation of the online and face-to-face coaching combination, which is associated with a statistically significant and substantial increase in credits earned during the third year of college (1.4 credits, 0.74 standard deviation units). The evaluation of this intervention included a small sample of students,[5] and thus more research is needed to assess this combination of technology and human interaction. Of all the interventions tested, the online and face-to-face coaching combination was also most consistently associated with measures of improved mental health and satisfaction with college. These effects may be important. An increasing number of administrators and policy makers are recognizing the value in addressing mental health and well-being on campus, over and above the objective of improving academic outcomes. More research is needed to understand whether this intervention type can produce consistent improvements in mental health and credit attainment, and if so, to identify the mechanism for such improvements. Although this intervention was positively associated with improvements to students' time management and study habits, it did not lead to significant increases in their average weekly study hours.

---

[4] The online coaching intervention and the online and one-way text coaching interventions produced statistically significant but small increases in credits earned during the third year of college.

[5] Oreopoulos' research team recruited large samples for the tests of online coaching (3,048 students), online with one-way text coaching (2,709 students), and online with two-way text coaching (5,298 students). The sample for the online and face-to-face coaching test was small (90 students).

Based on his own research and his interpretation of the research literature, Dr. Oreopoulos offered the following recommendations for future research on information and advising:

- **Nudging for 1-time actions holds more promise**. We should use nudging because it is very cost-effective, although trying to influence continuous behaviors such as study habits is more challenging than trying to influence one-time actions such as completing an application or signing up for courses.
- **Engage in qualitative research to help us better understand student decision making**. Often, students' decision making does not seem to make sense when viewed through survey or administrative data but does make sense when interviewers hear directly from students.
- **Fund replication research.** Replications should be used to assess the external validity of social-psychological and behavioral interventions.
- **Focus more on shoving and less on nudging**. Mandating use of existing services such as application assistance and advice, proactive tutoring and advising, and greater career transition support could produce better student outcomes.
- **Enhance college preparation programs**. Researchers should work with high school administrators to improve college preparation programs in order to improve college success.
- **Improve campus culture**. Researchers should work with college administrators to foster a campus culture of inclusiveness, care, and high expectations for students.
- **Consider operational changes**. Researchers and administrators should consider deeper operational change such as improvements to teacher quality or pedagogy.
- **Re-assess key outcomes**. College success should not be defined solely by degree attainment, or even grade achievement. We should work to better understand how colleges add value to and improve students' skills for employment and life in general.

Introductory Presentation #2: The State of the Art of Nudging Students to Postsecondary Success
Lindsay Page; University of Pittsburgh

Dr. Page reported on findings from a recent study of Georgia State University's (GSU) artificial intelligence-enabled chatbot called Pounce.[6] Central administrators manage Pounce, which they have integrated with the GSU student information system, although it is not integrated into courses or used by instructors. Pounce has shown success in reducing summer melt (Page & Gehlbach, 2017). Researchers and administrators are now investigating how Pounce can be used to target outreach to matriculated GSU students with the goal of improving student persistence and success.

---

[6] Pounce is the mascot of GSU; the chatbot was developed and provided by AdmitHub.

Dr. Page summarized key lessons from the in-progress evaluation of Pounce:

- Text outreach appears to be most effective when it pertains to required administrative processes or issues, particularly when these issues are acute, for example when a student has an outstanding balance due, a hold on their registration, or a FAFSA submission required for maintaining eligibility for financial aid. Thus, while text outreach may exert a small average impact on all students for tasks like FAFSA filing, it may exert a large impact on students in specific conditions.
- The research finds minimal evidence of success for text outreach in improving student take up of supplemental academic supports such as meetings with an adviser or tutor.
- The research finds no evidence that text outreach improves student take up of non-academic supports such as career awareness events.
- Pounce positively impacted the fall 2019 registration rate but had no effect on average GPA or credit attainment during 2018-19.

Based on her research on and experience with implementing nudge campaigns, Dr. Page offered the following recommendations for future use of and research on nudges:

1. **The messenger matters**. Students' first response to text outreach is often "who's this?" – they are looking for confirmation that the messenger is credible. Student engagement tends to be higher and opt-out lower when outreach comes from a trusted source with which the student has an affiliation. The trusted source can be an individual, a college, or an organization from whom the student would want and expect to hear. For nudging to improve academic achievement outcomes, course faculty should likely be involved (see Carrell & Kurlaender, 2020).
2. **Administrators can use data to target outreach to the students who need it**. Students can get saturated with incoming information from multiple sources. By incorporating information about the student into messaging campaigns, we can increase credibility, target messages to students if and/or when they need them, and provide more specific guidance; messages can be populated with institution specific deadlines, etc. For example, Texas high schools provided differentiated messaging to students depending on their FAFSA submission status and income verification requirement (Page, Castleman, & Meyer, 2019). Process-oriented administrative data help us to home in on problem points, such as students with outstanding balances, where affected students may be responsive to nudging.
3. **Intervene where the consequences of inaction matter**. Students appear most responsive to messages with a sense of urgency where consequences of inaction are immediate and tangible. For example, the failure to complete administrative requirements during the summer before college means that a student can't enroll in college; failure to act on an unpaid balance means that a student must withdraw from classes; and failure to submit a FAFSA form means that a low-income student cannot afford college. Text nudges may be best for encouraging such high stakes

administrative actions or should help students to understand the consequences of inaction.

4. **The complexity of the target behavior matters**. Students are most responsive when the target behavior is discrete (e.g., administrative tasks) with well-defined steps to completion. If we want to use nudging to improve academic outcomes, we need to think about the discrete inputs that we could nudge (e.g., attending office hours or additional study sessions) in addition to the best messenger to encourage that behavior (as noted above).

5. **We should be realistic about the power of nudges**. For their cost, text-based nudges can yield impressive impacts, but these impacts generally are still modest in absolute terms. I am looking forward to thinking together on whether and how such nudges can be incorporated into multi-pronged systems of student support.

Panel Discussion

The role of trust in advising

Panelists noted that it is difficult to gain students' trust, especially through virtual advising. In general, trust should be established before attempting to influence behavior; it is helpful to ask students' permission for making future contact. Text messages can be used in a variety of ways including for building engagement between students and advisers in high school. As text messages and other advising nudges are written, it is important to use language and a communication style that resonates with students. This style is frequently different from the style of older, more educated faculty and staff. Language should be inclusive. However, even stylistically astute messages from a trusted source may not be sufficient to produce the desired outcome. The Oreopoulos coaching interventions (reported above) employed messages from trusted upper division students and did not lead to changes in the targeted behaviors.

Tensions between light-touch interventions and the need for sustained support

Panelists discussed two axes along which messaging can differ: 1) mandated versus voluntary on one axis; and 2) urgent (targeted) versus ongoing on the other axis. Administrative data and students' responses to questions can be used to gauge students' information needs. However, students tend not to respond to optional requests; mandating an activity can be more effective. However, while students may be least responsive to voluntary, ongoing activities, these messages can still be important. For example, it is important to convey the importance of a time commitment to studying, as it is to convey the importance of adherence to a weight loss plan. Dr. Page noted research results which show the largest impacts when nudges address issues of urgency that have consequences for inaction.

Similarly, the panelists discussed how the timing of intervention matters. To date, text messaging to engage students at the application and matriculation steps has garnered more research attention than engaging students later in the postsecondary pipeline. Future research should address whether episodic reminders are more effective than a "marathon" approach that employs ongoing messages. To address messaging effects, researchers need better micro-level data to track students' activities after text dissemination.

A critical component of the tension surrounding light-touch interventions is that few students have academic plans. For light-touch interventions to work, they must have clearly defined goals. Interventions should be personalized so that they support plan development, define steps for achieving long-term goals, and encourage steps toward achieving those goals. While Pounce (the nudging intervention presented above) is most effective with urgent, short-term activities, commitment to long-term actions such as consistent studying are critical for course completions. Interventions should target these actions, and evaluations should test their effectiveness.

How can we determine what and when to nudge/intervene?

Students are faced with multiple possible paths and multiple decision points. It is difficult to identify what actions should be nudged because it is difficult for administrators to determine what actions are critical for making progress toward degree completion. Other sources of information for making decisions about where to intervene include the students themselves, who can discuss how to tailor interventions to encourage participation and responses. Other inputs include user data collected in learning management systems or from text messages responses. Artificial intelligence (AI) analytics can support strategies for interpreting these data. However, using AI can be costly, and interventions requiring it may not result in adequate return on investment.

Next steps for research related to light-touch interventions

Panelists identified several ongoing research efforts and future needs. One panel member is currently testing an intervention that combines weekly contact with review of adherence to recommendations for studying. Others suggested looking at successful K-12 interventions such as those that reduce absenteeism and/or increase homework, to identify promising intervention strategies for postsecondary students. Panelists recommended that nudges can be part of more comprehensive intervention strategies. Panelists agreed that a next stage in development of postsecondary interventions is to consider how to encourage formation of long-term habits associated with degree completion.

In addition, some panelists recommended that we identify ways to fix broken systems and engage in institutional and system-wide change, rather than simply developing and testing new products or intervention strategies within dysfunctional systems.

Rigorous evaluation is key to assessing the efficacy of information and advising interventions, and when evaluating interventions researchers should consider that control group students use support services. Relying upon observational studies of students interacting with services can be misleading because programs tend to reach the most responsive students. Targeting student sub-groups is a way of expanding program reach to connect with less responsive students. Interventions may positively (and significantly) affect students most in need, but these effects may not be apparent when researchers analyze larger analytic samples including students not in need of service. While some TWG members noted that light-touch/informational practice is ahead of research, others cautioned that research is necessary to test whether specific practices are leading to improved student outcomes.

Session 3: More Intensively Engaging Students through Advising and Coaching

Introductory presentation: In-Person Advising: A Really Rough Look
Eric Bettinger, Stanford University

Dr. Bettinger noted two types of intervention strategies that received substantial research attention ten years ago: incentives for postsecondary progress, including the MDRC Opening Doors Demonstration in Louisiana, and work by Angrist, Lang, and Oreopoulos (2009); and simplification of financial aid application procedures (Dynarski & Scott Clayton, 2006). A key element in both strategies was human contact between support staff and students.

Dr. Bettinger noted a subsequent literature on advising in high school beginning with a review of college access programs by Harvill et al. (2012) and followed by a "flood" of RCTs, most employing within-school randomization (Avery 2013; Bos et al., 2012; Carrell & Sacerdote, 2017; Castleman & Goodman, 2018; Oreopoulos, Brown, & Lavecchia, 2017; Phillips & Reber, 2018); and a few using whole-school randomization (Bettinger and Evans, 2019; Oreopoulos & Ford, 2019). Dr. Bettinger summarized the results from this evaluation literature as follows:

- Impacts obtained in experimental studies are generally small, and larger on college choice than attendance margins.
- Effects obtained in quasi-experimental analyses are always larger than experimental impacts.
- The largest impacts are often the result of bundled treatments, for example the combination of cash and advising in the Dartmouth study (Carrell and Sacerdote, 2017).
- Impacts tend to fade after one year.

Dr. Bettinger reported on the relatively smaller research literature on advising during college. Within this area of research and practice, advising is often bundled within college success programs that may also include summer bridge programs, enhanced freshman orientations, and learning communities. Researchers have noted a positive correlation between student services expenditures and outcomes (Ehrenberg & Webber, 2010).

Dr. Bettinger reported on an experimental evaluation of Inside Track,[7] an intensive, proactive coaching program that has increased retention rates in colleges with high dropout rates (Bettinger & Baker, 2014). Because the program emphasizes human contact and

---

[7] InsideTrack leaders engaged with researchers to prove the program's effectiveness, which led to conducting 17 lotteries between 2004 and 2007. The lotteries randomly assigned students to receive the InsideTrack coaching program; control group students received the business-as-usual supports offered by their institutions. The evaluation took place across public, private not-for-profit, and for-profit colleges.

therefore pays salaries to advisers, the cost of the program evaluated was approximately $1000 per student. Trained coaches contacted and met with students via phone, email, text, and social networking sites. Proprietary algorithms guided advisers' priorities for actively engaging with students, and software tracked their interactions with students as well as students' progress. The program resulted in a 5.3 percentage-point increase in retention relative to the control group[8] as of 12 months after program entry, which is when the program ended. After 4 years from program entry, coached students at the subset of colleges for which graduation data were available graduated at a rate 4.0 percentage points higher than uncoached students.[9]

Dr. Bettinger highlighted these key issues in need of attention within research on advising:

1. **Dosage and Heterogeneity**. Few studies randomize dosage to assess necessary and optimal treatment levels. Low rates of student compliance with suggested activities can result in treatment-control differences that are too low to achieve meaningful impacts on student outcomes. Differential effects by race and gender remains an underdeveloped issue in research to date; students' responses to advisers may be conditional on shared group membership.
2. **Targeting and Cost-effectiveness**. In a horserace between automated communications and live person-to-person advising, advising wins but its overall cost-effectiveness is low. Research is needed to address where intensive guidance is most needed, and we need to know whether students are using recommended services after receiving guidance. Targeting programs to students with clear developmental needs, for example in the BYU Pathways program, may enhance cost-effectiveness.
3. **Content**. Advising can address several key content areas including financial issues, course taking, study skills, and life skills. Advising practices differ substantially across institutions.
4. **Understanding the counterfactual**. Students already have access to many services. Comparing student outcomes across institutions does not necessarily estimate an advising effect because control institutions can increase their advising and services. It is difficult to convince colleges to change their approach to advising for research purposes.

Dr. Bettinger concluded by noting three factors that impede drawing clear conclusions about the impact of advising on student outcomes:

1. a longstanding belief in the effectiveness of advising;
2. the bundling of advising with other services; and

---

[8] The retention rate at 12 months for students in the control group was 43.5 percent. The 5.3 percentage-point impact translates to a 12 percent increase in the retention rate.
[9] The degree completion rate among students in the control group was 31.2 percent. The 4.0 percentage-point impact translates to a 13 percent increase in the completion rate.

3. heterogeneity in designs used to evaluate advising.

Panel Discussion

Who is providing advice?

One panel member pointed out that some programs employ phone-based advisers. Dr. Bettinger responded that advisers can be effective virtually after meeting an advisee in person. Another panel member responded that students get much of their advice from peers, and that this advice can be incorrect. In response, another panel member noted that practitioners have found that it can be useful to enlist and train peers to promote resources recommended by advisers. Finally, panelists also noted that a recent university survey found that parents and family are the most common source of college going information for students. Thus, institutions can work on developing partnerships between advising teams and students' relatives.

Identifying who needs help and understanding why they aren't obtaining it

Many campus services are voluntary, and regular users are not necessarily the students most in need. Current resource levels do not support universal, intensive interventions. Panelists discussed that colleges need to find ways to encourage those in need to access and use services. By targeting assistance to students most in need, institutions can provide them with coaching and planning advice rather than simply helping them to schedule classes.

Few institutions have the resources to assess which students are most in need of services. More planning is needed so that institutions can take a prevention approach that prioritizes advisers focusing on students most in need. To be effective, advising strategies should clearly specify advising components and processes, who is responsible for providing which services, and which types of services address specific student needs.

Students can be ashamed about poor performance and hesitate to re-engage with an adviser, especially if they have not recently contacted their adviser. Thus, it is helpful for adults at a college to proactively reach out and help students chart a path to completion. First-generation, low-income, and homeless students need a stable, trustworthy person to provide ongoing guidance.

One panel member stated that predictive analytics can help with determining which students need the most help, and that advisers need assistance with interpreting data. Dr. Bettinger pointed out that predictive analytics often focus on failure but can be re-purposed to predict "impactability." He suggested that the impacts of financial aid program impacts could be increased by modestly reducing the aid amounts to fund additional supports for students receiving the aid.

Considerations for implementing and testing intensive advising models

Grant funding has been a primary source of funding for intensive high-contact interventions. Unfortunately, when grant funding dries up, the intensive advising often disappears. Identifying alternate ways to cover the cost of intensive advising models would help students.

Panelists also noted that administrative policies can inhibit student progress and the reach of interventions. For example, some students do not complete required courses within the allowable number of re-enrollments. If administrative policy prohibits re-enrollment in these circumstances, the policy may effectively close off a student's opportunity to complete a degree. Researchers should consider such structural barriers when designing interventions.

Bad information is worse than no information at all. Technology systems that advisers work with should be up to date regarding institutional requirements and available academic pathways.

Coaching some students can benefit uncoached students since coaches inform administrators about students' needs. Consumers of research should look for improvements to baseline supports when interpreting within-school comparisons of program effects.

Replications often lack fidelity. Some funders require grantees to cite an evidence-based intervention to obtain funding, but implementers may not faithfully replicate the cited intervention. Null findings from replication studies can unfairly reflect on the reference intervention if it was not faithfully replicated.

Session 4: Hybrid and Comprehensive Intervention Strategies

Introductory presentation #1: The Evolution of Technology-Enabled Advising
Dr. Mei-Yen Ireland; The Bill & Melinda Gates Foundation

Dr. Ireland presented a brief history of technology-enabled advising. In the early stage, approximately 10 years ago amid a proliferation of advising technology, developers and administrators had unrealistic expectations about technology improving both the effectiveness and efficiency of advising at the point of service. This initial stage was followed by an advising reform stage which placed the focus on advisers implementing more effective practices, again at the point of service. Integrated advising, the next stage, emphasized combining academic, career, and financial advising to support students' academic and nonacademic needs. The integrated model requires institutional coordination as well as strong data and technology integration across functional areas. Holistic student supports, the current stage of technology-enabled advising expands the conception of student supports to include advising as one of many supports on campus along with career counseling, financial aid provision, and basic needs programs.

Dr. Ireland stated that experience over the past 10 years suggests that technological tools should be expected to support advisers rather than replace them. Effective advising interventions should address a variety of barriers to progress such as students lacking a clear plan, and the availability of many courses that do not count toward a degree program. Institutions should prioritize degree planning, advising to support students' overall development and progress, and effective use of data. For interventions to be successful, they should proactively intervene before a crisis point. Data and technology can help to identify risks and alert advisers so that they can link at-risk students to helpful programs and resources. Technology can support strategic intervention for students most in need. We should be leveraging data and technology to enhance human interactions rather than replacing them.

Dr. Ireland encouraged that advising should be sustained throughout a student's education. It should be strategically implemented, because not all students need high-intensity services all the time. It should aim to ensure students' smooth and efficient entry, proactively support their timely progression, and help them to seamlessly transition into the labor market or transfer to another academic institution. Effective advising provides real-time, multi-modal, personalized supports to all students by combining advising technologies, actionable data, and improved advising practices. The core components of effective advising include:

- course planning and degree audit,
- identification of at-risk students,
- caseload management, and
- data analytics and reporting.

Advising redesign initiatives should address eight categories of institutional needs:

1. leadership and change management,
2. structures and processes,
3. engagement and communication,
4. technology selection,
5. technology management, and
6. professional development and training.

Advising redesign should include a process for organizational learning and continuous improvement that sets metrics for success and a process for evaluating the metrics, establish a system to capture ongoing feedback, and create a culture that supports continuous improvement.

Introductory presentation #2: Using Information and Advising within Comprehensive Strategies to Promote Postsecondary Success
Dr. Alexander Mayer, MDRC

Dr. Mayer pointed out that low-income students face multiple barriers to college completion. These include academic challenges, financial barriers, achieving work-life balance, lack of college know-how, and institutional barriers. Most students who enter community college do not graduate or do not graduate on time.

One program that stands out for its comprehensive approach to addressing many of these barriers is the City University of New York's Accelerated Study in Associate Programs (CUNY ASAP). In a randomized controlled trial in CUNY and a replication study in Ohio, the intervention has been shown to nearly double three-year graduation rates (Weiss et al., 2019; Miller et al., 2020).

At the time of the study in CUNY,[10] the ASAP model offered three main areas of supports: financial supports including tuition waivers, free subway passes, and free use of textbooks; student services including advising, tutoring, and career services; and course enrollment supports including an ASAP first-year seminar, early registration, and assistance with course scheduling. In exchange, participants are required to enroll full-time, take developmental education early, and graduate in 3 years.

Dr. Mayer noted that one of the biggest challenges for college success interventions is getting students to use the services they need. Advising is central to program success, and the CUNY ASAP program incentivizes participation in advising by making MetroCard receipt, a substantial benefit equivalent to more than $100/month, conditional upon students' participation in key program services. During their first year of college, CUNY ASAP students

---

[10] CUNY has since adjusted several features of its program as it has expanded the program to serve more students. See: https://www1.cuny.edu/sites/asap/about/

reported visiting their adviser an average of 38 times per year. A low (1:80) adviser-to-student ratio facilitated this frequency of contact.[11]

Dr. Mayer noted that MDRC employs nudging strategies as well as financial incentives to encourage positive student behaviors. Recently, MDRC developed and tested a messaging campaign, informed by behavioral science, to encourage summer enrollment with and without tuition assistance. In a 10-college, 10,000-student randomized controlled trial, MDRC compared the outcomes of three groups of Pell-eligible students: students offered an informational campaign about summer enrollment; a group offered the informational campaign plus tuition assistance; and a control group. Both interventions caused more students to enroll in the summer. In the absence of the interventions, 26 percent of students enrolled in the summer. The informational campaign increased summer enrollment by 5 percentage points, up to 31 percent. The information campaign paired with a tuition waiver was even more effective, increasing summer enrollment by 12 percentage points, up to 38 percent (Weiss, 2019). Notably, the tuition waiver was inexpensive, costing only $44 dollars per student.[12]

Dr. Mayer described the Detroit Promise Path as an intervention that incorporates a management information system with coaching and messaging. The original College Promise program covered tuition and fees not covered by financial aid for city resident students attending local community colleges. Although the program boosted students' initial enrollment in college, persistence rates were short of the program's goal. DPP worked with MDRC to develop a student support program on top of the scholarship in which students are assigned a coach with a small caseload and directed to meet twice per month to discuss academic and non-academic issues. Students who meet with their coach as directed receive a $50/month stipend that they can use for expenses such as bus passes, books, and food. The management information system employs a technology tool that tracks students' participation in coaching sessions and other key activities. The tool also transmits messages to students by text and email regarding opportunities such as summer enrollment and summer employment. Because of the tool, coaches know which students do not attend their coaching meetings, and coaches can proactively contact students to encourage them to return to the program. Interim findings from the DPP evaluation indicate that over half of enrolled students met with their coach 5 or more times per semester, and the intervention significantly boosted students' enrollment and full-time enrollment during the first and second semesters of college (Ratledge et al., 2019).

---

[11] This is a feature of the program that CUNY has adjusted as the program has grown. CUNY modified the advisor-to-student ratio to 150:1 and uses a triage approach to meeting frequency based on students' needs. The modified version of the program was used in the Ohio programs that were modeled after CUNY ASAP.

[12] There are two reasons the per student cost is so low. First, despite the success of the intervention, 62 percent of students did not enroll in summer. Second, Pell grants and state aid cover some or all tuition cost for most Pell-eligible summer enrollees.

Dr. Mayer offered the following lessons from MDRC's evaluations of postsecondary interventions:

- **Reciprocal obligation** leads to increases in take-up of helpful services, by linking the receipt of financial benefits to participation in services.
- **Multimodal messaging strategies** can overcome the challenge of getting students' attention to issues that are important for their progress. Emphasizing the benefits of actions is a good messaging strategy.
- **Management information systems** can leverage data to facilitate proactive advising and automate messaging to students.

Panel Discussion

How can we improve participation in advising?

Incentives to encourage participation in advising are important. It is better to link advising to something students want than to remove something students have in response to non-participation.

It may be useful to incorporate advising into the core curriculum. This could be done in gateway courses and first-year experience courses. Often, most support is offered early in students' academic careers; it is also important to advise students during their sophomore and subsequent years.

We should focus on making advising and coaching the new normal. It is customary for all students to go to orientation. Some colleges are replacing it with calling students individually to assess their needs.

Advising must be high quality to draw students' participation.

We should avoid blaming students for poor outcomes and instead design institutions to support the desired student experiences.

Integrating career planning with advising

Career planning should begin early and be offered in a supportive, inviting setting. This process can begin in high school. In Virginia, high school students are required to have a career plan, and the data system sends students' plans to their advisers. Colleges should proactively begin career advising in freshman year. As part of this process, colleges should help students to realize which marketable skills they possess.

Encouraging students to define a clear curricular path would likely improve outcomes. Many community college students did not plan to attend college until just before their first term began. Institutions should support students in defining their goals once they arrive at college

Part of the process of defining goals can include experiential learning. Administrators can inform students of available opportunities as soon as they start college. Ideally, institutions would offer supplemental financial support to compensate lost income when they take unpaid internships.

Session 5: Bringing it all Together, and Next Steps

The NCER Commissioner asked TWG members for input regarding where the Institute of Education Sciences should consider making investments. Members provided the following recommendations:

Support research on strategies to drive institutional change

- Dissemination of high-quality research on effective strategies to systems and colleges is needed, to promote re-allocation of resources to effective strategies for assisting students. Relevant research should include qualitative as well as quantitative findings.
- Knowledge is needed on how to bring administrative units together to brainstorm, make use of administrative data to identify high-need students, and form cross-functional teams to solve problems.
- Knowledge is needed on how to break down silos between colleges, including research on how technology can be used to promote collaborative problem-solving across institutions.
- Knowledge on cost-effective ways to scale effective practices is needed.
- Institutions should be actively involved in determining what strategies get tested, and in the research as it progresses; institutions should be encouraged to apply for research grants.

Support qualitative research to understand students and how they respond to information and advising

- The field needs qualitative data about how and why students struggle, how they benefit from advising, and what colleges can do to help them.
- Research is needed that addresses the large amount of information that students are faced with and seeks to identify the types of information that students respond to and act on.

Develop and test strategies for helping students to persist

- Research is needed on how districts and schools can structure students' senior year of high school to help them prepare for the challenges of college.
- More research should be conducted on how to teach students time management and learning skills that they can apply during college.
- Research should consider how to integrate advising with classroom instruction and academic staffing.

Support replications of promising strategies

- Large-scale replication studies are needed for promising advising strategies.
- Replication studies should be designed to measure the effectiveness of promising intervention strategies for specific student groups, with the goal of enhancing effectiveness. Administrative data and predictive analytics can be used to identify students most likely in need of intervention. Variation in treatment components can be used to identify core components. Variation in settings can be used to determine which interventions are translatable to different contexts.

- Replications can also be used to test enhancements to cost-effectiveness. Researchers should evaluate the cost-effectiveness of targeting advising to students that need it most, and the cost-effectiveness of bundling advising with (relatively expensive) financial aid programs.

Appendix: Meeting Agenda

Information and Advising: Helping Students Navigate Postsecondary Education

AGENDA for IES/NCER Technical Working Group (TWG) meeting

Date/Time/Place: Friday, July 26, 2019, 8:30 am - 4:00 pm;
Potomac Center Plaza: 550 12th Street SW, Washington, DC 20024; Suite 4090/4095/4155

8:30 – 8:40: Welcome (Elizabeth Albro; National Center for Education Research)

8:40 – 8:50: Introductions (All)

8:50 – 9:00: Motivation for and Organization of the Meeting (James Benson; National Center for Education Research)

9:00 – 10:15: Modeling Information and Advising within the College Attainment Process

- A Model for Improving College Completion Rates (Trey Miller and Amy Feagin; AIR, College Completion Network)
- Panel Discussion

10:30 – 12:00: Nudges and Light-touch Informational Interventions

- The Limits of Nudges and Light-Touch Interventions for Promoting Postsecondary Success (Phil Oreopoulos; University of Toronto)
- The State of the Art for Nudging Students to Postsecondary Success (Lindsay Page; University of Pittsburgh)
- Panel Discussion

12:00 – 12:30: Break and Receive Lunch

12:30 – 1:30: More Intensively Engaging Students through Advising and Coaching

- What We Have Learned from Studies of Intensive Advising and Coaching (Eric Bettinger; Stanford University, College Completion Network)
- Panel Discussion

1:30 – 3:00: Hybrid and Comprehensive Intervention Strategies

- The Evolution of Technology-Enabled Advising (Mei-Yen Ireland; Gates Foundation)
- Using Information and Advising within Comprehensive Strategies to Promote Postsecondary Success (Alex Mayer; MDRC)
- Panel Discussion

3:15 – 4:00: Bringing it all Together, and Next Steps

References

Angrist, J., Lang, D., & Oreopoulos, P. (2009). Incentives and Services for College Achievement: Evidence from a Randomized Trial. *American Economic Journal: Applied Economics 2009*. 1(1), 136-163. https://www.aeaweb.org/articles?id=10.1257/app.1.1.136

Avery, C. Evaluation of the College Possible Program: Results from a Randomized Controlled Trial. (2013). NBER Working Paper No. 19562. https://www.nber.org/papers/w19562

Avery, C., Castleman, B. L., Hurwitz, M., Long, B. T., & Page, L. C. (2020). Digital Messaging to Improve College Enrollment and Success. NBER Working Paper 27897. https://www.nber.org/papers/w27897

Bailey, T. R., Jaggars, S. S., & Jenkins, D. (2015). *Redesigning America's Community Colleges: A Clearer Path to Student Success*. Harvard University Press.

Bettinger, E., Long, B. T., Oreopoulos, P., and Sonbonmatsu, L. (2012). The Role of Application Assistance and Information in College Decisions: Results from the H&R Block FAFSA Experiment. 127(3), 1205-1242. *The Quarterly Journal of Economics*. https://doi.org/10.1093/qje/qjs017

Bettinger, E. P., & Baker, R. B. (2014). The Effects of Student Coaching: An Evaluation of a Randomized Experiment in Student Advising. *Educational Evaluation and Policy Analysis*. 36(1), 3–19. https://doi.org/10.3102/0162373713500523

Bettinger, E., Long, B. T., Oreopoulos, P., and Sonbonmatsu, L. (2018). The Role of Simplification and Information in College Decisions: Results from the H&R Block FAFSA Experiment. NBER Working Paper 15361: *Addendum on College Completion*. https://data.nber.org/data-appendix/w15361/w15361.addendum.pdf

Bettinger, E. P., & Evans, B. J. (2019). College Guidance for All: A Randomized Experiment in Pre-College Advising. *Journal of Policy Analysis and Management*. 38(3), 579-599. https://doi.org/10.1002/pam.22133

Bos, J. M., Berman, J., Kane, T. J., & Tseng, F. M. (2012). The Impacts of SOURCE: A Program to Support College Enrollment through Near-Peer, Low-Cost Student Advising. Impact Paper Draft. Unpublished; accessed from lead author.

Carrell, S. & Sacerdote, B. (2017). Why Do College-Going Interventions Work? *American Economic Journal: Applied Economics*. 9(3), 124–151. https://doi.org/10.1257/app.20150530

Carrell, S. & Kurlaender, M. (2020). My Professor Cares: Experimental Evidence on the Role of Faculty Engagement. NBER Working Paper 27312. https://doi.org/10.3386/w27312

Castleman, B., & Goodman, J. (2018). Intensive College Counseling and the Enrollment and Persistence of Low-Income Students. *Education Finance and Policy*. 13(1), 19-41. https://doi.org/10.1162/edfp_a_00204

Castleman, B., & Page, L. (2015a). A Trickle or a Torrent? Understanding the Extent of Summer "Melt" Among College-Intending High School Graduates. *Social Science Quarterly*. 95(1). https://doi.org/10.1111/ssqu.12032

Castleman, B., & Page, L. (2015b). Summer nudging: Can personalized text messages and peer mentor outreach increase college going among low-income high school graduates? *Journal of Economic Behavior & Organization*. 115(1), 144-160. http://dx.doi.org/10.1016/j.jebo.2014.12.008

Dynarski, S. M. & Scott–Clayton, J. E., 2006. The Cost of Complexity in Federal Student Aid: Lessons from Optimal Tax Theory and Behavioral Economics. *National Tax Journal*. 59(2), 319-356. https://www.nber.org/papers/w12227

Gupta, H. (2017). The Power of Fully Supporting Community College Students: The Effects of the City University of New York's Accelerated Study in Associate Programs After Six Years. MDRC Report. https://www.mdrc.org/publication/power-fully-supporting-community-college-students

Gurantz, O., Howell, J., Hurwitz, M., Larson, C., Pender, M., & White, B. (2019). Realizing Your College Potential? Impacts of College Board's RYCP Campaign on Postsecondary Enrollment. EdWorkingPaper No. 19-40. Annenberg Institute for School Reform at Brown University. https://vtechworks.lib.vt.edu/handle/10919/96070

Harvill, E. L., Maynard, R. A., Nguyen, H. T. H., Robertson-Kraft, C., & Tognatta, N. (2012). Effects of College Access Programs on College Readiness and Enrollment: A Meta-Analysis. Society for Research in Educational Effectiveness Conference Abstract. ERIC Number: ED530404. https://eric.ed.gov/?id=ED530404

Hoxby, C., & Turner, S. (2013). Expanding College Opportunities. *Education Next*. https://www.educationnext.org/expanding-college-opportunities/

Miller, C., Headlam, C., Manno, M., & Cullinan, D. 2020. Increasing Community College Graduation Rates with a Proven Model: Three-Year Results from the Accelerated Study in Associate Programs (ASAP) Ohio Demonstration. MDRC Brief. https://www.mdrc.org/sites/default/files/ASAP_OH_3yr_Impact_Report_1.pdf

Oreopoulos, P., Brown, R. S., Lavecchia, & A. M. (2017). Pathways to Education: An Integrated Approach to Helping At-Risk High School Students. *Journal of Political Economy*. 125(4), 947-84. https://doi.org/10.1086/692713

Oreopoulos, P., & Ford, R. (2019). Keeping College Options Open: A Field Experiment to Help all High School Seniors Through the College Application Process. *Journal of Policy Analysis and Management.* 38(2), 426-454. https://doi.org/10.1002/pam.22115

Page, L. C., Castleman, B. L., & Meyer, K. (2019). Customized Nudging to Improve FAFSA Completion and Income Verification. *Educational Evaluation and Policy Analysis.* 42(1), 3-21. https://doi.org/10.3102/0162373719876916

Page, L., Sacerdote, B., Goldrick-Rab, S., and Castleman, B. (2019). Financial Aid Nudges: A National Experiment with Informational Interventions. The Hope Center for College, Community, and Justice: Working Paper No. 3 – September 2019. https://hope4college.com/new-national-evidence-on-the-efficacy-of-nudging-college-students/

Page, L. C., & Gehlbach, H. (2017). How an Artificially Intelligent Virtual Assistant Helps Students Navigate the Road to College. AERA Open, October-December 2017. 3(4), 1–12. https://doi.org/10.1177/2332858417749220

Phillips, M., & Reber, S. (2018). When "Low Touch" is Not Enough: Evidence from a Random Assignment College Access Field Experiment. CCPR Working Papers 2018: PWP-CCPR-2018-008. Los Angeles: California Center for Population Research at the University of California – Los Angeles. http://papers.ccpr.ucla.edu/index.php/pwp/article/view/1213

Rassen, E., Chaplot, P., Jenkins, D., & Johnstone, R. (2013). Understanding the Student Experience through the Loss/Momentum Framework: Clearing the Path to Completion. https://academiccommons.columbia.edu/doi/10.7916/D8N58JC7

Ratledge, A., O' Donoghue, R., Cullinan, D., & Camo-Biogradlija, J. (2019). A Path from Access to Success: Interim Findings from the Detroit Promise Path Evaluation. MDRC Online Report, April 2019. https://www.mdrc.org/sites/default/files/Detroit_Promise_Path_Report-Final_0.pdf

Song, M., & Zeiser, K. L. (2019). Early College, Continued Success: Longer-Term Impact of Early College High Schools. AIR Report, September 2019. https://www.air.org/sites/default/files/Early-College-Continued-Success-Longer-Term-Impact-of-ECHS-September-2019-rev3.pdf

Thaler, R. H., & Sunstein, C. R. (2008). *Nudge: Improving decisions about health, wealth, and happiness.* Yale University Press.

Webber, D. A., & Ehrenberg, R. G. (2010). Do expenditures other than instructional expenditures affect graduation and persistence rates in American higher education? *Economics of Education Review.* 29(6), 947-958. https://doi.org/10.1016/j.econedurev.2010.04.006

Weiss, M. 2019. How Can Community Colleges Increase Student Use of Year-Round Pell Grants? MDRC, Center for Applied Behavioral Science at MDRC, research brief. https://www.mdrc.org/sites/default/files/EASE_Brief_Phase%202_Final2.pdf

Weiss, M., Ratledge, A., Sommo, C., & Gupta, H. (2019). Supporting Community College Students from Start to Degree Completion: Long-term Evidence from a Randomized Trial of CUNY's ASAP. *American Economic Journal: Applied Economics.* 11(3), 253-97. DOI: https://doi.org/10.1257/app.20170430