

REVIEW PROTOCOL FOR THE PRACTICE GUIDE ON EFFECTIVE ADVISING FOR POSTSECONDARY STUDENTS

VERSION 4.0

This protocol guides the review of research that informs the What Works Clearinghouse (WWC) practice guide in the topic area of Effective Advising for Postsecondary Students. The review protocol is used in conjunction with the *WWC Procedures Handbook* and the *WWC Standards Handbook (versions 4.0)*.

PURPOSE STATEMENT

Student retention and graduation rates are persistent concerns in postsecondary education. A recent publication from the National Center of Education Statistics reports about 40 percent of undergraduate students at 4-year institutions did not graduate six years after starting their program (McFarland et al., 2019). Similarly, about 41 percent of students at 2-year degree-granting institutions either did not graduate or were not enrolled in another institution three years after the start of their program (McFarland et al., 2019). There are numerous reasons why students drop out of postsecondary institutions prior to completing a degree program, and they are sometimes unaware of or unable to access supports to help them navigate the academic and non-academic aspects of being a postsecondary student.

Advising plays a central role in supporting students navigating college. On campuses where advising is intentional and integrated into the student experience, advisors help students navigate academic and institutional challenges and can connect them to both academic and non-academic support services. Individuals who provide advising services often develop relationships with students to engage, challenge, and support them as they plan their academic journey and to help them connect to their academic and social contexts. In doing so, advisors' guidance can increase students' persistence towards degree completion and help prepare them to transition into employment or further education.

The purpose of the *Effective Advising for Postsecondary Students* Practice Guide is to make recommendations that inform best advising practice that helps postsecondary students persist and ultimately graduate at higher rates. These recommendations will be supported by evidence from rigorous research. Toward this end, the present evidence review aims to address the following research questions:

- Which advising interventions are effective at helping students progress and persist in college?
- Which advising interventions are effective at helping students improve academic achievement?
- Which advising interventions are effective at helping students complete their degree?
- Which advising interventions are effective at helping students improve their post-graduation educational and employment outcomes (e.g., earnings, wage, and graduate program enrollment)?

- Which advising interventions are particularly effective for certain subgroups of students (including first-generation college students, women, underrepresented minorities, academically underprepared students, students from low socioeconomic status backgrounds, returning students, and/or transfer students)?

KEY DEFINITIONS

The descriptions below capture some—but by no means all—of the many types of academic and non-academic advising interventions that are potentially covered by this evidence review.

Advising

Advising is a collaborative process between a student and an advisor designed to help the student realize his or her educational potential. This may involve academic and non-academic support, such as formulating personal and academic goals, navigating college requirements and resources, developing study skills, making sound decisions about financing college, balancing academic and nonacademic obligations, and overcoming other personal and academic barriers to persistence and completion. Reflecting the development of academic advising as a distinct professional practice and profession, advising is increasingly provided by trained, designated academic advisors; though, student support services staff, instructors/faculty, and peers, among others, may also contribute to advising activities.

Freshman Orientation

Freshman Orientation, also known as new-student orientation programs, can be found in 95 percent of four-year institutions (Pascarella & Terenzini, 2005). The orientations are 1-2 day programs provided in a large-group format for all incoming students over the summer. Students are introduced to a broad range of resources and services, provided an opportunity to meet with advisors individually or in groups, and may be offered other academic and non-academic workshops and activities, emphasizing both social and academic integration. Orientations are often facilitated by academic advisors, faculty, peer-advisors, among other staff from student support services.

First Year Seminar

First Year Seminars (FYS), also referred to as college success courses or freshman seminars, are often in the form of a 1-2 credit course offered exclusively to first-year students. The aim of First Year Seminars is generally to promote successful transition and transformation into college. While seminars vary in terms of content and focus, most are designed to introduce students to “campus resources, time management, study skills, career planning, cultural diversity, and student development issues” (Barefoot & Fidler, 1992, p. 2). The courses may also aim to instill a sense of belonging to the college. Some First-Year Seminars include a Service Learning component, facilitating access to community experiences to which students can apply what they learn in the classroom. First Year Seminars are typically taught—or co-taught—by faculty, academic advisors, or other student support staff (Hunter & Linder, 2005; Pascarella & Terenzini, 2005). First-Year Seminars may be offered independently or as part of a predefined cluster of courses, whereby all students in the seminar are taking the same set of courses during their first quarter/semester (see Learning Communities below).

Learning Communities

Learning Communities, also referred to as linked learning communities, Freshmen Interest Groups (FIG), or Thematic Interest Groups (TIGS), are predefined course packages that groups of students take concurrently. Learning Communities are based on the theory that active learning in a community-based setting can improve academic outcomes by increasing social as well as academic integration (Smith, MacGregor, Matthews, & Gabelnick, 2004). Toward this end, Learning Communities tend to incorporate two components: a course package with an integrated curriculum and a community or common cohort of learners (Lenning & Ebbers, 1999). The course curriculum is typically themed around a specific topic or area of study (e.g., social justice, environment, social studies, art), some Learning Communities are residential (e.g., the cohort of students live on the same floor of the residence hall), and some Learning Communities are reserved for and tailored to the needs and interests of specific student groups (honors, athletes, STEM students). As mentioned above, Learning Communities often include a First Year Seminar.

Mentoring Programs

Mentoring programs involve a pairing between a more experienced, skilled, or knowledgeable person (e.g., an upper-level student or instructor) and a less-experienced student. Mentoring may take place in educational or other community settings. Typically, the mentor receives training or support to maintain a reciprocal, personalized relationship with the student, and provides information, support, and guidance (Cannata, Garringer, MacRae, & Wakeland, 2005; Crisp & Cruz, 2009). Mentoring programs may focus on interpersonal skills, self-esteem, career maturity and development, psychological and emotional support, as well as academic planning, troubleshooting academic assignments, or tutoring in problem areas (Cannata et al., 2005; Crisp & Cruz, 2009; DuBois, Holloway, Valentine, & Cooper, 2002; DuBois et al., 2011). Typical mentoring programs are characterized by a 1:1 relationship between the mentee and mentor and occur over a period of time (i.e., more than one session). However, group formats in which one or more mentors meet with a small group of students may also be used. Mentoring programs generally involve mentors in a non-professional helping capacity. For example, professional staff who counsel students at a counseling center would not be considered mentors, though these same individuals could serve as mentors outside the counseling center in a non-professional capacity.

Coaching

Closely related—yet distinct—from mentoring programs are coaching programs for students. These coaching services typically target academically at-risk students; though, coaching programs may be made available more broadly. Coaching programs are developmental in their student support, typically facilitating dialogues and activities that assist students in developing personal, academic, and career goals as well as strategies for reaching these.

Comprehensive Support Programs

Comprehensive support programs include any program that provides long-term bundled support (e.g. ASAP). Also included are Scholarship/Pipeline/Pathways/TRiO Programs that provide select groups of students comprehensive support services with the aim of enhancing student success. These services may be provided via case management and in-depth coaching, or in targeted fields (e.g., underrepresented minority students in STEM). These programs, which often begin in the freshman year and provide services through transfer or undergraduate degree completion, provide a bundle of student support, including financial aid, mentoring, social/networking events, intensive advising, bundled courses, as well as instructional support and tutoring services. Some of these scholarship

programs involve pre-freshman Summer Bridge Programs, and take pre-college booster courses in math, science, and other relevant areas. Some pathway programs involve partnerships between community colleges and four-year schools.

Tutoring

Academic tutoring refers to supplemental instruction in reading, writing, study skills, mathematics, science, and other subjects, typically conducted one-on-one or in small groups of students with a tutor. Tutors may be peers, staff, faculty, or external contributors and are not required to be affiliated with a school. Tutoring programs may be face-to-face or online, and may be tailored to individual students or to the needs of the group. Tutoring practices may include coaching and support for academic tasks such as completing homework, understanding lecture material, or review of written work, as well as strategies for becoming better learners.

Advisor Training

Advisor training refers to a broad range of professional development activities, ranging from one-day workshops and brief trainings to more formal degree programs in advising (e.g., certificates, Bachelor, Masters, or PhD programs). The trainings may be delivered in-person, online, or in blended formats. Participants may include advisors, faculty, or student peers, or any other student support staff receiving training with the aim of providing student advising.

ELIGIBILITY CRITERIA

Identifying Studies for Review

The *WWC Procedures and Standards Handbook (version 4.0)* discusses general procedures for conducting a literature search. For the Effective Advising Practice Guide, a broad electronic database search will be conducted to identify potentially relevant studies. Once relevant studies have been identified, the WWC will update the electronic database search and supplement this with targeted searches of government and non-government agency websites, relevant non-profit organizations that might fund research on the intervention, and by reviewing the bibliographies of literature reviews, meta-analyses, and primary studies of the intervention under review. The review team will also search the WWC database of previously reviewed studies to identify studies that have met standards in prior reviews. Those studies will be re-reviewed using the eligibility criteria and evidence standards described in this protocol. The team will also identify studies that have been rated as ineligible in prior reviews and will confirm that they are ineligible for this review based on the criteria described in this protocol. A broad search strategy for the effective advising topic area is detailed in Appendix A.

Studies must meet several criteria to be eligible for review. These relate to the population that was sampled, the intervention that was studied, the study design that was used, outcomes that were measured, and when the study was conducted. Each of these is discussed below.

Eligible Populations

To be eligible for review under this protocol, a study must include postsecondary students (students enrolled in a postsecondary education program) in the United States or Canada.

In general, the WWC determines a study rating based on average intervention effects and will report subgroup analyses only for groups that are identified in the protocol as being of theoretical, policy, or practical interest. For studies reviewed under this protocol, eligible subgroups include:

- First-generation college students;
- Underrepresented minorities (based on race/ethnicity);
- Gender;
- Students from low socioeconomic status backgrounds (e.g., Pell Grant recipients);
- Academically unprepared students (e.g., incoming students with developmental course requirements);
- First-year students;
- Community college students;
- Transfer students;
- Returning adult students (i.e., students over 24 years of age and with some college but no degree);
- Academically at-risk students;
- Veterans and military connected students;
- Students who were formerly connected with the criminal justice system;
- Students in foster or relative (kinship) care;
- Students experiencing homelessness.

Eligible Interventions

For this review, advising interventions that support postsecondary success for college students must be primarily focused on improving student outcomes during and after college. Thus, programs may be focused on improving the academic performance of students while attending college, increasing the number of students who transfer from 2- to 4-year colleges or attain a degree or certificate, or improving post-college labor market outcomes. Within the scope of the present guide, a broad range of interventions are relevant:

- **Advising centers and units.** There are many ways of organizing advising services. Pardee (2004) classified three basic organizational structures: a centralized model (all advisors organized in one or more advising units), a decentralized model (individual advisors in individual departments), and a shared model (some combination of advising units and individual advisors). In addition to these, specialized units or teams of advisors may provide advising for specific subpopulations (at-risk students, underrepresented minorities, veterans).

- **Interventions to support students during the critical first year.** The first year of college is critical for student success. Recognizing the need to support students during their first year of college, many advising interventions are designed to ensure that students transition well and are academically and socially integrated. These interventions include freshman orientations, First Year Seminars, Learning Communities (with advising components), and other advising activities and programs that orient and prepare students to college life and the campus community. Interventions may target first-year students in general or particular subpopulations of these (e.g., transfer or returning students) more specifically.
- **Comprehensive support programs.** Comprehensive support programs include any program that provides long-term bundled support (e.g., ASAP). Also included are Scholarship/Pipeline/Pathways/TRiO Programs that provide select groups of students comprehensive support services with the aim of enhancing student success in targeted fields (e.g., underrepresented minority students in STEM). These programs, which often begin in the freshman year and provide services through transfer or undergraduate degree completion, provide a bundle of student support, including financial aid, mentoring, social/networking events, intensive advising, bundled courses, as well as instructional support and tutoring services.
- **Mentoring and coaching.** Mentor and coaching programs, facilitated by advisors, faculty, student peers, or other student support staff, may provide academic and non-academic support to students. While many mentoring programs target academically at-risk students, some focus on first-year students more broadly. Mentoring and coaching interventions may help students develop personal, academic, and career goals as well as strategies for reaching these. Many comprehensive support programs include a faculty mentoring component.
- **Specific advising approaches, policies, practices, techniques, and tools.** In addition to, and often embedded within, the above, there are a broad range of advising strategies, approaches, policies, techniques, and tools that hold relevance for the advising guide. These include, but are by no means limited to, information campaigns (e.g., presentations/emails/letters/phone/sms interventions providing students with information); student-monitoring systems (e.g., early-alert systems); specific academic or career planning tools; technology-enhanced advising tools or systems (e.g., apps and online communities); specific advising models and approaches (e.g., strength-based advising, intrusive advising, proactive advising) or specific advising techniques (motivational interviewing); as well as advising for specific issues, for example, major reselection advising.
- **Advisor training/professional development.** Training and development programs for effective advising also hold relevance for the guide. These trainings may focus on specific advising approaches, practices, and tools, and range from one-day workshops and brief trainings to more formal degree programs in advising (e.g., certificates, Bachelor, Masters, or PhD programs). The trainings may be delivered in-person, online, or in blended formats. Participants may include advisors, faculty, or student peers, or any other student support staff receiving training with the aim of providing student advising.

Only interventions that are replicable are eligible for review. The following characteristics of an intervention will be documented by the WWC, so that practitioners other than developers can reliably reproduce the intervention with different participants, in different settings, and at other times:

- Targeted population;
- Description of intervention provider or administrator, including their qualifications;
- Description of the intervention, including details of the services provided, unit of delivery (e.g., group, individual), medium/media of delivery (e.g., in-person, online), and other activities that are part of the intervention (e.g., academic planning tool);
- Description of dosage, including duration, frequency, and intensity of advising activities required to implement the intervention;
- Cost, which may include staff salaries to participate in training or provide the intervention; expenses for space, materials, and equipment needed for training and/or providing the intervention; travel and per diem expenses for training; price charged for intervention participants; and other intervention inputs; and
- Source of funding (when available).
- Description of the counterfactual, including details of the services availed to comparison group students that sufficiently capture what the intervention is being contrasted to.

Eligible Research

In order to be eligible for review a study must examine the effects of an advising intervention. If a study does not examine the effects of an intervention, or if it is not a primary analysis (e.g., if it is a meta-analysis or other literature review), then it is not eligible for review.

- ***Topic.*** The study must be focused on the effects of an advising intervention on one or more eligible educational or labor market outcomes.
- ***Setting.*** The study setting must be a postsecondary educational institution. Postsecondary education is any form of schooling occurring after the secondary level (i.e., after high school) and may include public or private technical colleges, community colleges, four-year institutions, and any other institution offering a postsecondary certificate or degree. Interventions may start as early as the summer immediately following high school and run through a student’s entire postsecondary career.
- ***Time frame.*** The study must have been published within 20 years of the year of the review (for example, 1999 or later for reviews occurring in 2019). Rigorous evaluations of interventions implemented in this time frame test versions of interventions most likely to be available today and under conditions most likely to be current. Studies must be publicly available (accessible online or available through a publication, such as a journal) at the time of the original or updated literature search.
- ***Sample.*** The study sample must meet the requirements described in the “Eligible Populations” section above. Studies with samples that are comprised primarily of high school students, even those concurrently enrolled in postsecondary education (i.e., dual enrollment), are not eligible for review under this protocol.

- **Design.** The study must be empirical, using quantitative methods and inferential statistical analysis, and as described by the *WWC Procedures and Standards Handbook* (version 4.0), must take the form of a randomized controlled trial (RCT) or use a quasi-experimental design (QED), a regression discontinuity design (RDD), or a single-case design (SCD).
- **Language.** The study must be available in English.
- **Location.** The study must include students in the United States, in its territories or tribal entities, at U.S. military bases overseas, or in Canada.

Review team leadership should be notified when studies present counterfactuals other than business-as-usual (BAU), such as studies that compare two interventions to one another. These studies will be reviewed by review team leadership to determine whether their results can be reasonably combined with other studies without biasing WWC calculations. Review team leadership will advise reviewers on characteristics of the comparison condition to document so the counterfactual can be clearly documented in WWC reports.

Eligible Outcomes

To be eligible for review, a study must also report outcomes from a relevant postsecondary outcome domain. These include: (a) progressing in college, (b) academic achievement, (c) postsecondary degree attainment, (d) credential attainment, and (e) post-graduation outcomes. Operational definitions for each outcome domain are provided below. When measures from an official and an unofficial source are available (e.g., grades reported by the institution vs. self-report) the WWC will focus on the official source.

- **Progressing in college** refers to progress toward the completion of a degree, certificate, or program. Examples of ways that credit accumulation might be operationally defined in studies include: (a) number of college-level credits earned, (b) number of terms of continuous enrollment, (c) enrolled vs. did not enroll the next semester, and (d) completion of a single course that was the focus of the intervention. Completion of a single course will only be reported if other measures within this domain are not reported by the study. The number of non-college level credits earned (e.g., developmental credits) is not an eligible measure of credit accumulation.
- **Academic achievement** refers to the extent to which students master academic content. Outcome measures may include (a) final grade in a single college-level course, (b) grade point average (GPA) in multiple college-level courses per term/quarter/semester/cumulative or within major program of study, and (c) the proportion of college-level courses passed (or failed). Scores on department-wide exams, standardized tests, and professional or industry exams (e.g., the NCLEX-RN) are also eligible. With the exception of department-wide exams, measures that exist below the final course grade level are not eligible (e.g., average test score, score on a particular assignment or project).¹ Also ineligible are measures of academic achievement that do not directly contribute to student grades (e.g., a math test that is given after an experimental manipulation, the performance on which has no implications for a student’s performance in a specific course).
- **Postsecondary degree attainment** refers to the completion of an associate or a baccalaureate degree. Outcome measures in this domain may include (a) percentage of

¹ The “department-wide” exam criterion ensures that students are tested consistently across treatment and comparison groups, and those exam scores contribute meaningfully to overall academic achievement.

students graduating (sometimes within a specified time period, such as three or four years) and (b) average time to degree completion. Outcomes pertaining to completing or progressing toward a graduate-level degree will not be included.

- **Credential attainment** refers to the completion of an industry-recognized credential, certificate, or license. Outcome measures in this domain may include (a) certificate completion rates, (b) non-degree award receipt rates, and (c) certifications from third-party licensing or credentialing bodies.
- **Post-graduation outcomes** refer to continued enrollment in college-level degree programs, employment, and earnings after graduating from a postsecondary institution. Outcome measures in this domain may include (a) proportion of students enrolling at a four-year school (for advising interventions at two-year colleges), (b) proportion of students enrolling in a graduate degree program (for advising interventions at four-year colleges). Outcome measures for employment and earnings may include (a) proportion of students employed (or not employed), (b) proportion of students employed full-time (not employed full time), (c) proportion of students employed in a particular field of study (or not), (d) cumulative earnings over specified time period, and (e) earnings in a typical week within a specified time period.² Earnings received during a student's course of study are ineligible for review.

Outcomes Measured at Different Points in Time

When outcomes are measured at multiple time points, the follow-up outcome measured closest to the end of the intervention on the full sample will be prioritized as the primary finding. This will allow for more clear attribution of the intervention to the outcome observed (especially in QEDs), relative to prioritizing the longest follow-up observation. Notable exceptions include:

- In the post-secondary degree attainment domain, the longest follow-up time point will be selected as the primary finding.
- For employment and earning outcomes, two primary findings will be presented when they are available: (1) the follow-up outcome period closest to the end of the intervention and (2) the longest follow-up time point.
- When cumulative outcomes are reported, prioritize the outcome where measurement starts closest to the end of the intervention and extends to the longest follow-up time point.

² Total individual or household income is not an eligible outcome. An intervention that successfully increases individual earnings might decrease public benefit receipt, with the result that the participant's income might increase, decrease, or remain constant even though the intervention successfully increased earnings. Further, household income might include spousal earnings; an intervention that increases a participant's earnings might induce the spouse of the participant to reduce his/her hours worked, especially if the spouse was working an additional job to support the participant during training.

EVIDENCE STANDARDS

Eligible studies are assessed against WWC evidence standards, as described in the *WWC Procedures Handbook (version 4)*, Section IV: Screening Studies and Section V: Reviewing Studies, as well as the *WWC Standards Handbook (version 4)*. Generally, these standards assess outcome reliability and validity, attrition, baseline equivalence, and similar methodological and statistical model issues. This review determines the overall WWC study rating (see the *Procedures and Standards Handbook version 4.0* for further details). Details related to sample attrition in RCTs and baseline equivalence in QEDs and high-attrition RCTs are outlined below to highlight the way they are operationalized for this topic area.

Eligible Study Designs

Studies that use group designs (RCTs and QEDs), RDDs, or single-case designs (SCDs) are eligible for review using the appropriate standards.

Sample Attrition

The *WWC Standards Handbook (version 4.0)* discusses the sample attrition standards used by the WWC in the following sections:

- Section II.A—“Sample Attrition: Is the combination of overall and differential attrition high?” – in Step 2 of the WWC review process for individual-level group design studies.
- Section II.B—“Is the study a cluster RCT with low cluster-level attrition?” – in Step 1 of the WWC review process for cluster-level group design studies.
- Section II.B—“Is there a risk of bias due to non-response of individuals?” – in Step 3 of the WWC review process for cluster-level group design studies.
- Section II.D—“Calculating attrition when rating CACE estimates” – in Section 3 of the WWC standards for reviewing complier average causal effect estimates.
- Section III.C—in Standard 2 of the WWC standards for reviewing regression discontinuity designs.

In the *WWC Standards Handbook*, Figure II.2 illustrates the attrition boundary and Table II.1 reports attrition levels that define high and low attrition. Based on the choice of the boundary, the study review guide calculates attrition and whether it is high or low. For most studies this review will entail use of the *optimistic* boundary for attrition based on the assumption that most attrition in studies of advising interventions would be due to factors that are not strongly related to intervention status. We assume that postsecondary students can have a range of life events that lead them to have missing outcome data that are unrelated to intervention status.

Joiners in Cluster Randomized Controlled Trials (RCTs)

According to the *WWC Standards Handbook (page 23)*, to receive the highest rating a cluster RCT must limit the risk of bias due to individuals entering the cluster after the time of random assignment. This is because the presence of joiners in an analytic sample might introduce bias into estimates of an intervention’s effectiveness. The WWC defines a joiner as any student who enters a cluster, such as a community college school or course, after the results of random assignment are known to any individual who could influence a student’s placement into a cluster (for example, a

college advisor). In some cases, joiners might enter clusters after random assignment, but before anyone outside of a study team could have known about cluster random assignment results. The WWC never considers these joiners to pose a risk of bias because the decisions that led these individuals to join clusters could not have been affected by the intervention. However, the burden for demonstrating that individuals could not have known about the intervention rests with the study authors.

In some cases, joiners who enter clusters relatively early in the study period have less potential to introduce bias than those who enter later. This is because late joiners might be more likely to do so because of the intervention. Therefore, the WWC differentiates between *early joiners* and *late joiners*. For this review protocol, we will consider college students to be *early joiners* if they enter a cluster within 6 weeks after the results of random assignment are publicly known. That is, the early period for joiners ends 6 weeks after the start of the academic year if the results of random assignment were announced over the summer; otherwise, the early period ends 6 weeks after the results of random assignment were announced. *Late joiners* are those who enter clusters after 6 weeks.

With that background, the default disposition for this review is that ***all joiners in the analytic sample are expected to pose a risk of bias*** (there are exceptions for early joiners outlined below). Therefore, a study that includes at least one such joiner in the analytic sample does not limit the risk of bias from joiners.

An exception to the default rule that all joiners in the analytic sample pose a risk of bias is when: (a) colleges/institutions, a group of colleges such as a coordinated group of community colleges, or blocks of courses within colleges represent the unit of assignment, and (b) the following conditions are in place:

- The intervention is not expected to directly affect joiners' enrollment or placement decisions. One example of an intervention that should not directly affect enrollment or placement decisions is when treatment and comparison groups are offered different types of potentially useful services, such as two competing mentoring interventions. In this case, we would not expect that individuals would be more likely to go out of their way to join one mentoring intervention over the other unless there is time to closely investigate and consider the different options. In this scenario, ***only late joiners pose a risk of bias***.
- Another example of an intervention that would likely not directly affect enrollment is when treatment group members receive a low-profile approach that is integrated into curricula of their college, where individuals are unlikely to know about this add-on to the curricula even after the point of random assignment. This is consistent with idea that joiners are likely to be unaware that a cluster is part of a study condition. In this scenario, ***only late joiners pose a risk of bias***.

Not all scenarios can be anticipated. When an intervention and unit of assignment in a cluster RCT do not fall into a category described above, the Review Team Leadership has discretion to decide whether the joiners pose a risk of bias. Any time such discretion is exercised, the background and rationale of decisions will be documented in intervention reports.

Baseline Equivalence

If the study design is an RCT or RDD with high levels of attrition or a QED, the study must satisfy the baseline equivalence requirement for the analytic intervention and comparison groups. The *WWC Standards Handbook* discusses how authors must satisfy the baseline equivalence requirement in:

- Section II.A—“Baseline Equivalence: Is equivalence established at baseline for the groups in the analytic sample?” – in Step 3 of the WWC review process for individual-level group design studies.
- Section II.B—“Does the study establish equivalence of individuals at baseline for groups in the analytic sample?” and “Does the study establish equivalence of clusters at baseline for groups in the analytic sample?” – in Steps 4 and 7 of the WWC review process for cluster-level group design studies, respectively.
- Section II.D—“Procedures for rating CACE estimates when attrition is high” – in Section 5 of the *WWC Standards* for reviewing complier average causal effect (CACE) estimates.
- Section III.C—in Standard 3 of the *WWC Standards* for reviewing RDDs.

This review assesses baseline equivalence within each domain and analytic sample. Elaborations follow:

- The outcome domains for this review cover multiple constructs, so an *outcome-by-outcome* approach to establishing equivalence is followed. The implication is that it is possible for a baseline difference to exceed 0.25 standard deviations on a given outcome, but this need not influence other outcomes within the domain. So, for example, a large baseline difference in mathematics will render all mathematics outcomes as not meeting WWC standards, but it would still be possible for a reading contrast from the same study to meet standards with reservations in the academic achievement domain. Furthermore, when the baseline difference for a pre-intervention measure is in the statistical adjustment range (that is, it is between 0.05 and 0.25 standard deviations), the adjustment must be made only in the analysis of the associated outcome measure. For example, if A, B, and C are available as pre- and post-intervention measures all within one domain, and the pre-intervention difference in B requires statistical adjustment, only the analysis of outcome B must adjust for B.
- In cases where multiple baseline measures of SES and/or academic achievement are available, the Review Team Leadership is responsible for selecting the variable(s) to be used in the baseline equivalence assessment prior to the equivalence assessment being performed. For example, if both math and verbal scores on a college entrance exam are available, and the primary outcome is whether or not students passed their first college level math course, then the Review Team Leadership may decide that the score on the math portion of the entrance exam is the only achievement measure on which baseline equivalence will be assessed. However, if the primary outcome is attainment, then the Review Team Leadership might decide to assess balance on both the math subtest and the verbal subtest.

1. Baseline equivalence of individuals

For studies that must satisfy baseline equivalence of individuals, including cluster-level assignment studies being reviewed for evidence of effects on individuals, the baseline equivalence requirement must be satisfied for the analytic intervention and comparison groups. Pre-intervention measures of the outcome used in the analysis will be acceptable. However, in some cases it would be unusual to observe a meaningful baseline measure of some postsecondary outcomes, such as degree attainment. Within the supporting postsecondary success topic area, reasonable pre-intervention characteristics might encapsulate pre-college traits and events, such as high school GPA, college admission tests and work experience. These characteristics can be used as proxy pre-intervention variables to assess baseline equivalence within the domain to which they logically belong. For example, high school GPA can be used to establish baseline equivalence for outcomes within the academic achievement domain, and prior work experience can serve as a proxy baseline variable within the labor market domain.

With that background, reviewers should consider two options for baseline equating:

1. The first approach reviewers should take is to assess equivalence using a pre-intervention (baseline) measure of the outcome used in the analysis. If a pre-intervention measure of the outcome used in the analysis is not available, then baseline equivalence must be established on a pre-intervention measure of a proxy variable from within the same domain as the outcome used in the analysis. For example, high school GPA or SAT/ACT scores might be used to establish baseline equivalence for an academic achievement outcome measured in the freshman year.
2. If neither a pre-intervention measure of the outcome nor a proxy measure from the same domain are available, then baseline equivalence must be established on both of the following:
 - A continuously scaled pre-intervention measure of academic achievement. For example, high school GPA or SAT/ACT scores might be used to establish baseline equivalence.
 - A pre-intervention measure of student socio-economic status (e.g., FAFSA expected family contribution, family income, high school free- or reduced-price lunch status, parent education levels, Pell grant eligibility) is acceptable for establishing baseline equivalence.

2. Baseline equivalence of clusters

Assessing equivalence of clusters

In general, considerations for satisfying baseline equivalence of individuals also apply to satisfying baseline equivalence of clusters. In particular, baseline equivalence of clusters in the intervention and comparison groups must be satisfied by using the same baseline measures listed above for assessing baseline equivalence of individuals, and the same statistical adjustment requirements apply.

Acceptable samples for demonstrating baseline equivalence of clusters

For this review, any of the following three samples can be used to satisfy the baseline equivalence requirement for the analytic sample of clusters (provided the data are representative of the individuals who were in the clusters at the time the baseline data were collected).

- (a) The analytic sample of the same individuals from any pre-intervention time period.
- (b) Individuals from the same cohort as the individuals in the analytic sample, within the same clusters. The baseline data may be obtained at the time that clusters were assigned to conditions or during the year prior to when clusters were assigned to conditions.
- (c) Individuals from the previous academic year cohort, in the same grade, and within the same clusters, as individuals in the analytic sample.

If authors provide baseline information at multiple time periods, a reviewer should assess baseline equivalence using the information collected at the latest period prior to the start of the intervention. If authors provide baseline information for multiple samples, a reviewer should assess baseline equivalence using the sample listed first in the list above—that is, (a) should be used if available, then (b), and then (c). If authors provide baseline information for multiple samples across multiple time periods, the reviewer should consult review team leadership to determine which information to prioritize.

When a study examines the effectiveness of an intervention in multiple time periods, the sample used to satisfy baseline equivalence of clusters in the base period (for example, the school year after random assignment) also satisfies baseline equivalence of clusters in the later time periods (for example, 2 years after random assignment), so long as the outcome data are representative of the individuals in the clusters.

Statistical Adjustments

The *WWC Procedures Handbook* discusses the types of adjustments made by the WWC in Section VI: Reporting on Findings. For “mismatched” analysis (that is, when a study assigns units at the cluster level but conducts analysis at the individual level), this topic area uses the WWC default intra-class correlation coefficients of 0.20 for all student achievement outcomes and 0.10 for all behavior outcomes, unless a study-reported intra-class correlation coefficient is available.

PROCEDURES FOR CONDUCTING THE LITERATURE SEARCH

The *WWC Procedures Handbook, version 4.0*, discusses the procedures for conducting a literature search in Section III: Identifying Relevant Literature and Appendix B: Policies for Searching Studies for Review. For the Effective Advising Practice Guide, a broad search will be conducted to identify potentially relevant studies, using the search terms identified in Exhibit 1. Our expert panel will also be asked to identify and recommend interventions with a large body of causal evidence likely to be of interest to decision makers.

The review team will also search the WWC database of previously reviewed studies to identify studies that have met standards in prior reviews. Those studies will be re-reviewed using the eligibility criteria and evidence standards described in this protocol. The team will also identify studies that have been rated as ineligible in prior reviews and will confirm that they are ineligible for this review based on the criteria described in this protocol. The WWC will also supplement the electronic database search with targeted searches of government and non-government agency

websites, relevant non-profit organizations that might fund research on postsecondary success interventions, and via reviewing the bibliographies of literature reviews, meta-analyses, and primary studies of the intervention under review.

In the final step, each citation gathered through this search process will undergo a screening process to determine whether the study meets the eligibility criteria established in the review protocol. This screening process is described in Chapter IV of the *WWC Procedures Handbook*.

Exhibit 1: Search Parameters and Terms Used for the Initial Electronic Search

The search will cover the following Bibliographic Databases:

- ERIC (EBSCO version)
- EconLit
- Web of Science
- ProQuest Dissertations and Theses
- PsycInfo
- Education Research Complete

The following search parameters apply:

Timeframe: 1999 to present

Language: English

Other parameters: search on titles and abstracts ONLY; not keywords or full-text.

The document must have a Block A, Block B, and Block C term in either the title or abstract.

Search terms

For each of the following databases	Block A: Methods terms	Block B: Eligible intervention terms	Block C: Outcomes	Other
-ERIC (EBSCO version) -EconLit -Web of Science -ProQuest Dissertations and Theses -PsycInfo -Education Research Complete	TI(causal or "comparison group*" or "control group*" or "effectiveness stud*" or efficacy or experiment* or "intervention group*" or "matched sample" or "matched group*" or "mixed method*" or "program*group*" or "propensity score*" or random* or "research design" or "treatment group*" or "treatment effect*" or quasi-experiment* or QED or "RCT" OR "comparison sample*" OR "control sample*") or AB(causal or "comparison group*" or "control group*" or "effectiveness stud*" or efficacy or experiment* or "intervention group*" or "matched sample" or "matched group*" or "mixed method*" or "program*group*" or "propensity score*" or random* or "research design" or "treatment group*" or "treatment	TI("academic advis*" OR "advis*" OR "first year seminar*" OR "first-year seminar*" OR "freshman seminar*" OR "summer program*" OR "summer bridge program*" OR "summer pre-orientation*" OR "success course*" OR "first-year course*" OR "first year course*" OR "development course*" OR "development workshop*" OR "college 101" OR "university 101" OR "university studies" OR "learning communit*" OR "thematic interest group*" OR "freshman interest group*" OR "freshmen interest group" OR "support program*" OR "degree success program*" OR "educational opportunity program*" OR "wraparound program*" OR "Accelerated Study in Associate Programs" OR "ASAP-lite" OR "one-stop program*" OR "single-stop program*" OR "promise program*" OR "pipeline program*" OR "TRIO program*" OR "student orientation" OR "freshman orientation" OR "orientation" OR "degree mapping" OR "mapping coordinators" OR "advising model" OR "advising theory" OR "advising approach" OR "appreciative advis*" OR "proactive advis*" OR "developmental advis*" OR "holistic advising" OR "strengths-based advis*" OR "intrusive advis*" OR "flipped advis*" OR "motivational interviewing" OR "learning management system*" OR "early alert system*" OR "mentor*" OR "academic coach*" OR "student success coach*" OR "tutor*" OR "academic counseling" OR "academic guidance" OR "academic support*" OR "student support*" OR "academic plan*" OR "academic support*" OR "transfer program*" OR "college counselor*" OR "career specialist*" OR "career counselor*" OR "career strategy specialist*" OR "career center liaison*" OR "retention specialist*" OR "peer advisor*" OR "advisor training" OR "advising professional development" OR "advising administration" OR "advising system*" OR "advising structure" OR "advising office*" OR "advising center*" OR "advising unit" OR "advising program*" OR "First year program*" OR "First-year program*" OR "at-risk	TI(retention OR persistence OR attrition OR credit* OR "grade point average*" OR gpa OR "academic standing" OR "pass rate" OR "academic performance" OR "college-ready" OR degree* OR diploma* OR credential* OR certificate OR graduat* OR transfer OR "time-to-degree" OR "academic motivation" OR "academic self-efficacy" OR "academic integration" OR "social integration" OR earning* OR employ* OR salary OR wage* OR "completion rate*" OR "student performance" OR retain OR "academic success" OR "student* success" OR "academic outcome*" OR "student outcome*") OR AB(retention OR persistence OR attrition OR credit* OR "grade point average*" OR gpa OR "academic standing" OR	Limit by: Language = English Date published = 1999-2019 Expanders: Apply related words

	<p>effect** or quasi-experiment* or QED or "RCT" OR "comparison sample*" OR "control sample**")</p>	<p>student** OR "students at risk" OR "academic assistance" OR "college assistance" OR "guidance program**" OR "scholar* program**" OR "social support**") or AB("academic advis** OR "advis** OR "first year seminar**" OR "first-year seminar**" OR "freshman seminar**" OR "summer program**" OR "summer bridge program**" OR "summer pre-orientation**" OR "success course**" OR "first-year course**" OR "first year course**" OR "development course**" OR "development workshop**" OR "college 101" OR "university 101" OR "university studies" OR "learning communit**" OR "thematic interest group**" OR "freshman interest group**" OR "freshmen interest group" OR "support program**" OR "degree success program**" OR "educational opportunity program**" OR "wraparound program**" OR "Accelerated Study in Associate Programs" OR "ASAP-lite" OR "one-stop program**" OR "single-stop program**" OR "promise program**" OR "pipeline program**" OR "TRIO program**" OR "student orientation" OR "freshman orientation" OR "orientation" OR "degree mapping" OR "mapping coordinators" OR "advising model" OR "advising theory" OR "advising approach" OR "appreciative advis**" OR "proactive advis**" OR "developmental advis**" OR "holistic advising" OR "strengths-based advis**" OR "intrusive advis**" OR "flipped advis**" OR "motivational interviewing" OR "learning management system**" OR "early alert system**" OR "mentor**" OR "academic coach**" OR "student success coach**" OR "tutor**" OR "academic counseling" OR "academic guidance" OR "academic support**" OR "student support**" OR "academic plan**" OR "academic support**" OR "transfer program**" OR "college counselor**" OR "career specialist**" OR "career counselor**" OR "career strategy specialist**" OR "career center liaison**" OR "retention specialist**" OR "peer advisor**" OR "advisor training**" OR "advising professional development" OR "advising administration" OR "advising system**" OR "advising structure" OR "advising office**" OR "advising center**" OR "advising unit" OR "advising program**" OR "First year program**" OR "First-year program**" OR "at-risk student**" OR "students at risk" OR "academic assistance" OR "college assistance" OR "guidance program**" OR "scholar* program**" OR "social support**")</p>	<p>"pass rate" OR "academic performance" OR "college-ready" OR degree* OR diploma* OR credential* OR certificate OR graduat* OR transfer OR "time-to-degree" OR "academic motivation" OR "academic self-efficacy" OR "academic integration" OR "social integration" OR earning* OR employ* OR salary OR wage* OR "completion rate**" OR "student performance" OR retain OR "academic success" OR "student success" OR "academic outcome**" OR "student outcome**")</p>	
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Additional Sources

Literature reviews for this topic area involve searching the websites and electronic databases listed in Appendix B of the *WWC Procedures Handbook* as well as the following websites:

- Abt Associates
- ACF
- American Educational Research Association (AERA)
- American Institutes for Research (AIR)
- American Technical Education Association (ATEA)
- Annie E. Casey Foundation
- Aspen Institute
- The Association of Community College Trustees
- Brown University's Annenberg Institute for School Reform
- California Center for Regional Leadership (CCRL)
- The Campbell Collaboration Systematic Reviews
- Carnegie Foundation for the Advancement of Teaching
- Career-Pathways.org
- Center for Research in Educational Policy (CREP)
- Center for the Study of Higher Education at Berkeley (CSHE)
- Center on Education Policy
- Charles Dana Center at University of Texas-Austin
- City University of New York
- Community College Research Center (CCRC)
- Consortium for Policy Research in Education (CPRE)
- Cornell Higher Education Research Institute working papers
- ECMC Foundation
- Education Commission of the States
- Education Northwest
- Gates Foundation
- Indiana Next Generation Manufacturing Competitiveness Center (N-MaC; Purdue University)
- Institute for Higher Education Policy
- The Institute for College Access and Success
- Jobs for the Future
- John. J. Heldrich Center for Workforce Development (Rutgers University)
- Joyce Foundation
- JP Morgan
- Kresge Foundation
- Laura and John Arnold Foundation
- Mathematica Policy Research
- MDRC
- National Academic Advising Association (NACADA)
- National Association for Developmental Education
- National Association of State Workforce Agencies (NASWA)
- The National Association of Student Personnel Administrators (NASPA)

- National Association of Workforce Boards (NAWB)
- National Center for Postsecondary Research
- National Center for Postsecondary Improvement
- National Education Association (NEA)
- National Resource Center for the First Year Experience and Students in Transition
- The Office of Community College Research and Leadership
- Oklahoma State University (OSU) Institute of Technology
- Pacific Resources for Education and Learning (PREL)
- Social Policy Research Associates
- Society for Research on Educational Effectiveness (SREE)
- Stanford Center for Education Policy Analysis (CEPA)
- University of Illinois School of Labor and Employment Relations
- University of Wisconsin Center on for Education Research (WCER)
- Urban Institute
- U.S. Department of Labor, Trade Adjustment Assistance Community College and Career Training Grant Program (TAACCCT)
- U.S. Department of Labor, Workforce Innovation Fund (WIF)
- Virginia Tech Office of Economic Development
- The Washington Center at The Evergreen State College
- WISCAPE working papers

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