

MARCH | 2015

TAACCCT Grant Evaluation
CCCS Developmental Education Redesign
Subject Matter Expert Review

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I. INTRODUCTION

In support of a statewide redesign of developmental education at Colorado community colleges, a portion of the Trade Adjustment Assistance Community College and Career Training (TAACCCT) Grant awarded to the Community College of Denver was targeted towards a system-wide change in colleges' approach to developmental education. After careful review of the existing research on developmental education and exploration of current reform models across the country, the Developmental Education Task Force proposed (and secured the state's community college governing board for) the following guiding principles for the statewide redesign:

To accelerate students by reducing the amount of time, number of developmental credits, and number of courses in the developmental sequence so students can be successful in a college level course. Accelerated learning will require a curriculum redesign. The following five principles are to be applied to curricular work:

1. Use reverse curriculum design to redesign courses
2. Design courses for what students need to know for success in college
3. Encourage active learning by including active and/or experiential learning experiences with each lesson
4. Make curriculum design and assessment of student learning and success a continuous process (see National Center for Academic Transformation work)
5. Provide students with individualized assistance through embedded affective skills, professionalism, and support services as much as possible in the process

(<https://resources.cccs.edu/education-services/developmental-education-task-force/>)

Contributing to the evaluation of this component of the TAACCCT Grant (the developmental education redesign), the comments below provide a formative assessment of CCCS' revised approach to developmental education.

The purpose of this Subject Matter Expert review was to explore and provide feedback on four aspects of developmental education reform across the Colorado Community College system: (a) the redesign of developmental math (creation of developmental math pathways), (b) the redesign of developmental writing and reading (College Composition and Reading), (c) the nature of student advising for and placement into these pathways, and (d) implementation of these new pathways at a sample of colleges. To address these aspects of the developmental education redesign, the report consists of sections II through VI:

- II. Scope of the Review
- III. Overview of the CCCS Developmental Education Redesign
- IV. Developmental Math Redesign
- V. Developmental Writing & Reading Redesign (College Composition & Reading)
- VI. Conclusion

II. SCOPE OF THIS REVIEW

The purpose of this review was to explore and provide feedback on four aspects of developmental education reform across the Colorado Community College system:

- (a) the revised developmental math pathway
- (b) the new College Composition and Reading (CCR) pathway
- (c) the nature of student advising for and placement into these pathways
- (d) implementation of these revised pathways at a sample of colleges

Data sources for this review included the following:

1. Materials available on the sites devoted to the project, including:
<http://cccscoetc.weebly.com/developmental-education.html>
<https://resources.cccs.edu/education-services/developmental-education-task-force/>
2. Open Educational Resources (OER) for the revised courses; in particular, course syllabi, schedules, assignments, and other instructional resources posted on
www.skillcommons.org/handle/taaccct
www.contentbuilder.merlot.org/toolkit/users/cccscoetc
www.cccscoetc.weebly.com
3. Qualitative interview data culled from interviews that the external evaluators conducted at a sample of colleges--with specific focus on participants' comments regarding student services involvement, and the implementation process.
4. Quantitative data on completion rates for courses offered during the period Spring 2012-Spring 2014, as well as ACCUPLACER scores for students who tested for the first time from November, 2013 through October, 2014.
5. Information posted on colleges' websites regarding Fall 2014 course offerings, ACCUPLACER preparation, and developmental education advising.

Caveats

- Given the magnitude of CCCS' developmental redesign, the number of participating colleges, and the large amount of accessible documentation and OER materials, this analysis does not represent a comprehensive review.
- CCCS' developmental education reform is still in progress. Many colleges did not begin full implementation of the revised pathways until Fall 2014. Some of the most critical issues around this reform can only be evaluated as colleges continue to implement, assess, and refine the redesigned pathways and courses.

- Materials under review were all developed prior to Fall, 2014, and therefore represent a snapshot of colleges' prior activities, but do not necessarily accurately represent the substance of colleges' most current policies and practices.

III. OVERVIEW OF THE CCCS DEVELOPMENTAL EDUCATION REDESIGN

Review of the Developmental Education Task Force documentation, process narrative, and final recommendations indicate that CCCS' revised approach to developmental education is built on a coherent, research-based set of principles.

Operationalizing the redesign across the colleges in the system has required a tremendous amount of effort among faculty, staff, and administration. Participating in the process has spurred quite a bit of thinking (and re-thinking) about how to support student development and success; it has resulted in tremendous operational and organizational changes across the colleges; and it has fostered within- and cross-disciplinary faculty collaboration. The many individuals at every level who have engaged in the process deserve great kudos.

The work of developmental education redesign across the CCCS, however, is not finished. The TAACCCT Grant has supported the successful design and initial operationalization of a highly promising approach to developmental education. Yet successful implementation of the revised approach depends on continued effort in the following areas:

- Systematic data collection and analysis at each college, in the service of ongoing evaluation and improvement
- Sustained attention to curriculum and instruction within the newly constructed courses and pathways
- Continued capacity building across CCCS, with particular attention to the variation in colleges' internal capacity to engage in curricular reform and ongoing evaluation.

IV. DEVELOPMENTAL MATH REDESIGN

Developmental math redesign has consisted of moving from a four-course sequence in preparation for college algebra to a multiple path approach, based on a student's program of study and the student's assessment level (low, middle, high). Students who test at the lowest level are directed to non-credit assessment prep and/or ABE, skill refresher programs. These options for students at the lowest level may be offered through the college, or by community-based providers. In theory, students testing at middle or high level have a developmental math choice of Algebraic literacy (MAT 055) towards college algebra, or Quantitative Literacy (MAT 050) with paths to statistics, math for liberal arts, or career math. Ideally, the result is no more than one developmental math course for most students. For students who test at the highest remedial level, colleges can potentially offer mainstreaming within any of the three 100-level paths, including Algebra, Non-Algebra (transferable) options, and Non-Transfer (CTE) options.

Low, middle, and high have been defined by the following score ranges on the ACCUPLACER exam, using the Elementary Algebra (EA) assessment, and the Arithmetic (AR) assessment.

LOW:	Under 30 EA Under 40 AR	Students who do not meet these cut-off scores are not able to enroll in the college's revised developmental math pathway because they do not have skills that meet the minimum high school thresholds that are required to use federal financial aid for courses.
LOWER-MIDDLE:	EA 30-45	Students in this range are directed to MAT 050 (Quantitative Literacy)
MIDDLE:	EA 45-59	Placement of students in this range should be determined by each student's educational trajectory. Students with academic plans that require college algebra should be placed in MAT 055 with concurrent enrollment in MAT 025 (Algebraic Literacy Lab).
HIGH:	EA 60-84	Placement of students in this range should be based on each student's intended educational trajectory. Students who are do not plan to pursue an academic program that requires algebra may choose the non-algebra pathway.

This multi-path approach represents a huge departure from CCCS' prior developmental math sequence. First, appropriate placement is no longer solely dependent on assessment scores. Instead, the goal is to provide students with scores between 45-84 with a developmental math course that is directly applicable to students' next steps. Therefore, placing these students in the appropriate developmental math course requires an advising approach that identifies each student's intended course of study and helps the student choose between the algebra pathway or the non-algebra pathway. Second, an essential premise of this multi-path approach is that the math competencies addressed in each developmental math course and the contextualization of those competencies are directly linked to the student's intended course of study. In other words, reverse design of the curriculum for MAT 050 should result in a course that actively engages students in applying the math to examples and contexts they will continue to encounter in their academic/career educational path. Likewise, reverse design of the curriculum for MAT 055 should result in a course that develops students' algebraic proficiency within the context of STEM applications. Such a course would prepare students not just for College Algebra, but would also prepare students—through direct application and contextualization—for the actual STEM courses that list College Algebra as a pre-requisite.

As noted above, the theoretical and evidentiary foundations for this multi-path approach are very strong. The approach is congruent with evidence-based theories of learning, and it is informed by the most promising practices implemented at community colleges across the country. At the same time, the complexity of this approach produces a particular set of

implementation challenges. Each of the implementation challenges requires sustained attention as colleges continue offering the redesigned developmental math offerings.

CHALLENGE 1: LOWEST SCORING STUDENTS

Low scoring students (those who score below 30 on the ACCUPLACER EA or below 40 on the AR) are at risk of being denied postsecondary opportunities. Across CCCS, low scoring students represent a significant proportion of students requiring math remediation. Review of all initial EA scores on ACCUPLACER from November, 2013 through October, 2014 revealed that roughly 16% of first-time testers across CCCS scored at the low level. Without sustained attention to this challenge, the developmental math redesign could substantially decrease postsecondary opportunities for this large group of students.

Addressing the risks for low scoring students involves differentiating between and providing effective advisement and preparation opportunities for two categories of low scoring students: those who require a refresher, and those who require remediation. “Refresher” students are those for whom a low ACCUPLACER score can be addressed by a review of the math being tested and/or some practice on the types of questions that appear on the test. The evidence from CCD’s soft landing options for math suggests that this “refresher” category of student can be well served by such options, if the options are well designed and accessible to students. “Remedial” students, however, are those for whom short-term review and test-taking practice will not suffice to raise their score above the low range. This is the group that is hardest to serve, and most in need of clear and effective advising about possible options, including referral to adult basic education (ABE) programs. Given that ABE funding in Colorado is quite low, the outlook for this group of students is uncertain.

Regardless of each college’s strategies for addressing these low scoring “refresher” students and “remedial” students, clear and supportive messaging may serve an important function. For example, Aims’ website highlights the options available to low scoring students, in a FAQ format. Following the question “What are my options if I score below 40 in Reading, below 50 in Sentence Skills, or below 40 in Arithmetic on the Accuplacer?” is a short list of option, including Aims’ Academic Pathways Office, and several local adult education organizations, along with contact information.

Finally, because this group of students is both most *in-need* and most *at-risk*, tracking what happens to these students after they are directed to the alternative remedial options should be a core component of future evaluation efforts.

CHALLENGE 2: OPERATIONALIZING MAT 050 AND 055 AS DISTINCT PATHWAYS

The issue here is the extent to which each college is enacting the *multiple pathways* concept as originally intended. For example, MAT 050 and MAT 055 are intended to function as separate pathways, not as a two-course sequence for students whose EA ACCUPLACER scores are less than 60. Certainly, students who choose the non-algebra pathway, successfully complete MAT 050, and then wish to move into the algebra pathway may need to take 055 to move into

algebra pathway. However, this course of action—among students with initial EA scores from 45 through 59—could reflect a gap in student advisement.

The available evidence indicates that some colleges are not implementing the pathway as originally intended. A college that does not offer MAT 025, for example, is not providing the recommended one-semester developmental math option for students who wish to pursue the algebra pathway (MAT 055 + 025). For colleges that do offer the MAT 025 lab, there still remains a question of whether the advisement approach is oriented towards accurately assessing students' educational goals, and thereby directing students to the appropriate algebra or non-algebra option based on those goals.

CHALLENGE 3: MAINSTREAMING HIGHEST SCORERS

There is strong research evidence to indicate that students who score near, but below the cut-off score for remediation benefit more from placement in college-level work than in the developmental education. Such research supports CCCS' redesign recommendation to mainstream students who score from 80-85 on the EA ACCUPLACER.¹ Colleges, however, are not necessarily offering the mainstreaming option (which would involve offering MAT 091, 092 and 093). It may be useful to determine these college's rationales for not pursuing the mainstreaming option and provide more structure and support to encourage broad adoption of these models.

CHALLENGE 4: REVISING CURRICULUM & PEDAGOGY

CCCS' developmental math redesign conceptualizes each developmental math option (course and/or lab) as providing students with instruction that contextualizes the math, and thereby enables students to understand the relevance and applicability of the math. This new approach to developmental math depends on more than simply offering the new courses; it also depends on a substantive revision of curriculum and pedagogy. For an accelerated model of developmental education to succeed, the content and instruction [from prior courses] cannot simply be re-packaged into a compressed timeline.

The materials available for this review do not provide much evidence that curriculum and pedagogy have been re-conceptualized across the colleges' new developmental math courses. Many of the OER materials consist of generic course syllabi, schedules that list general topics, and homework assignments that identify appropriate textbook problems. Such documents do not suggest a re-visioning of the pedagogical approach, in part because they offer little information about how the instruction will actually proceed within the course.

¹ Mainstreaming within the non-transfer pathway would place students in Applied Quant Lab (MAT 091) with concurrent enrollment in MAT 103, 107, 108, 109, or 112. Mainstreaming within the transfer/non-algebra pathway would place students in Quant Lab (MAT 092) labeled for high-level remedial students

Given the difficulty of substantive pedagogical change, and the concomitant need for faculty members to participate in robust, ongoing professional learning opportunities aimed at increasing student learning, continuing professional development is critical.

V. DEVELOPMENTAL WRITING & READING REDESIGN (CREATION OF CCR)

Prior to the redesign, developmental reading and developmental writing formed two tracks, with 3 courses in writing (English), and 3 courses in reading. Redesign has consisted of the creation of College Composition & Reading (CCR), a developmental offering that integrates reading and writing into a single course.

Placement into the appropriate CCR course is based on students' ACCUPLACER scores. Low, middle, and high levels have been defined by the following score ranges on the ACCUPLACER exam, using the Reading Comprehension (RC) and the Sentence Skills (SS) assessments.

LOW	Below 40 RC and/or below 50 SS	Placement options: soft landing or CCR 092 + CCR 091 (lab)
MIDDLE	RC 40-61 and/or SS 50-69 SS	Placement in CCR 092
HIGH	RC 62-79 and/or SS 70-94	Mainstreaming in 100-level course CCR 093 + discipline course or CCR 094 + Eng 121

Thus, two key essential ideas have formed the basis for the revised CCR courses: integration of reading and writing into each course, and the creation of developmental courses that are applied—contextualized in ways that enable students to move directly to transferable, college-level courses.

This approach produces a particular set of implementation challenges. Like the implementation challenges of the math pathways, each of the CCR implementation challenges requires sustained attention after the Fall 2014 transition deadline.

CHALLENGE 1: INTEGRATION OF READING & WRITING

In light of CCCS' distinct developmental tracks for reading and writing, and concomitant differentiation between reading instructors and writing instructors, the task of implementing an integrated instructional approach to reading and writing raises issues around how each CCR course has been developed, the extent to which each course reflects an *integrated* instructional approach, as well as the instructional expertise required to teach the redesigned courses. By

definition, an integrated instructional approach does not connect reading and writing in a unidirectional way, but rather guides students towards using processes and strategies in reading to inform their writing, and vice versa.

While review of the existing OER materials indicates that the new CCR courses combine reading and writing, the extent to which the courses offer an integrated instructional approach to reading and writing is beyond the scope of this report.

CHALLENGE 2: PLACEMENT INTO CCR COURSES

The documented guidelines for placement focus on the use of students' scores on two ACCUPLACER assessments (RC and/or SS), and direct colleges to place new students based on the lower of the two assessment scores. It is not entirely clear whether colleges will evaluate the usefulness of these guidelines in directing students to the integrated CCR courses, given that the state is developing a new placement test.

Regardless of the form that the new developmental assessments take, the use of assessment scores in placing students, as well as the extent to which students succeed in their CCR placement are both issues that require continued evaluation. Depending on the instructional approach adopted in different CCR courses, a writing assessment could prove more useful than assessment of "sentence skills." Alternatively, attention to entry-level reading competence could prove more useful than any other assessment. Assessments of reading comprehension or writing skills could prove more illuminating when complemented with non-cognitive assessment items. Finally, appropriate placement guidelines cannot be considered or assessed without careful attention to curriculum and instruction of the CCR courses. In other words, appropriate placement plays a role in student success or failure within individual courses, but so do the actual learning opportunities afforded students within those courses.

CHALLENGE 3: FOSTERING COLLEGE-WIDE RESPONSIBILITY FOR WRITING (& READING)

One of the strengths of the CCR redesign is that it is clearly informed by research on writing and reading instruction, particularly evidence that reading and writing skills are not generic or generally transferable to multiple contexts. One key implication of such research is that reading and writing development for adults is most effective when it occurs within the specific context they plan to apply those reading and writing skills to (in a specific career domain or discipline, for example). A second, related implication is that courses that introduce students to a domain or discipline (often the 100-level courses) are the sites where all students would benefit from explicit reading and writing development—as an integral part of the course. This second implication may seem beyond the scope of the CCCS redesign, in the sense that it is not only applicable to students who take developmental coursework but also to students who bypass developmental coursework. It does, however, raise questions: if reading and writing instruction need to be contextualized to a very specific domain, then where should that instruction take place, and who is responsible?

CHALLENGE 4: LOWEST SCORING STUDENTS

Addressing the literacy needs of the least prepared students mirrors the challenge of low scoring students in math. In theory, the CCR 091/092 option, which enables low scoring students to enter CCR 092 with additional support, may be effective for many low scorers. Because this option is not mandatory, colleges may decide to forego the possibility, and therefore limit the opportunities for these most at-risk students. As noted in the section on the math pathways, without effective options and clear advisement about those options, low scoring students risk being diverted away from the college.

CHALLENGE 5: CONTEXTUALIZATION OF CCR CURRICULA

An essential aspect of the CCR pathway is the emphasis on contextualizing reading and writing instruction. The extent to which colleges have successfully developed courses that accomplish explicit and coherent contextualization is not entirely clear (for the same reasons that the nature of the revised math curricula is difficult to evaluate). For the most part, the OER materials available for this review outline the general learning outcomes, assignments, and texts, but do not illuminate the nature or scope of the contextualization. Interestingly, there is a substantial discrepancy between the available curricular materials and the commentary that individual faculty members have provided, whether in video form or in the *Voices on Redesign* documentation. In particular, the statements from faculty members in *Voices on Redesign* illuminate pedagogical issues and approaches that remain invisible elsewhere. Given the difficulty of assessing the curriculum and instruction across these three CCR courses, the section below focuses on the challenges involved in accomplishing the intended kind of contextualization in CCR 093.

CCR 093 as a Case in Point

Conceived as a course that is directly linked to a specific, disciplinary course, and therefore fostering students' reading and writing development as they apply those competencies to their concurrent disciplinary course, CCR 093 holds the most promise of the new CCR courses in terms of contextualizing reading and writing skills.

At the same time, CCR 093 may also be one of the most difficult CCR courses for colleges to implement. One of the key implementation challenges is logistical: offering a 093 as a section for students who are co-enrolled in a specific disciplinary course requires a minimum number of students for each 093 section to run. With this in mind, NJC, as a small college, decided not to offer this course right away, noting that the college does not enroll enough students to "divvy" them up into different sections based on co-enrollment in disciplinary courses. Other colleges have responded to this logistical challenge by offering more generic sections of CCR 093, so that each section includes students who are concurrently enrolled in a range of discipline courses. Unfortunately, offering a more generic section of 093 undermines the intent of the reform.

Another critical implementation challenge involves the substantive planning required for a linked course such as 093 to offer students a coherent experience across the co-enrolled

courses. Advocates of the various models of learning communities acknowledge that providing students with an integrative learning experience across co-enrolled courses is an immensely time- and effort-intensive project for instructors.

From this perspective, Kim Moultny, of ACC, has provided a useful OER in video form. Describing the process she undertook at ACC to develop possible sections of CCR 093, Kim outlines a thoughtful strategy for identifying high enrollment gatekeeping GT courses to link with, developing appropriate course competencies, and ensuring the rigor of the writing instruction afforded students. A useful companion piece to this OER would be an update video that reports on the current stage of the process.²

VI. CONCLUSION

The Colorado Community College System has embarked on a tremendous transformation of its approach to developmental education. The fact that the colleges have operationalized the new developmental pathways constitutes a huge success.

Nonetheless, the redesigned pathways in developmental math and College Composition and Reading (CCR) require continued efforts, both within individual colleges, and across the system. In particular, the challenges specific to the math redesign and the CCR redesign require sustained attention and ongoing evaluation of the colleges' efforts. Some of the most critical issues include:

- The provision of appropriate advisement to lowest scoring students, including “refresher” and “remedial” students.
- Access to effective preparation opportunities for lowest scoring students, accompanied by tracking of those students after initial contact with the college.
- Operationalization of the *multiple pathways* approach to developmental math through accurate assessment of students' career goals and appropriate placement.
- System-wide adoption of the mainstreaming option for highest scorers.
- Continued provision of ongoing professional learning opportunities to faculty in support of ongoing curricular and pedagogical revision.

² Interestingly, the result of these efforts at ACC, at least for the Fall 2014 semester, appear to be a version of CCR 093 that requires on-enrollment in COM 115, COM 125, PSY 101, SOC 101, but is not explicitly linked to a single disciplinary course.

- Committing sustained attention to (and ongoing improvement of) the quality of contextualized instruction as it is enacted inside classrooms and as it relates to student learning.

In sum, operationalizing the new pathways and offering the new courses constitute the initial stage of this promising college-wide redesign. Central to the success of this developmental education reform are (a) systematic data collection and analysis at each college, in the service of ongoing evaluation and improvement, (b) sustained attention to the curriculum and instruction within the newly constructed courses and pathways, and (c) continued capacity building across the Colorado Community College System, with particular attention to the variation in colleges' internal capacity to engage in curricular reform, and the provision of ongoing professional learning opportunities.