SREB | Advanced Career

A Mixed-Methods Evaluation of Advanced Careers: Rigorous Pathways in High School that Blend High-Quality Career and Technical Education Courses with a College-Ready Academic Core

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Background & Context

Background

The Southern Regional Education Board's Advanced Career (AC) pathway programs were created in response to the growing demand for a workforce prepared with the broad-based, higher-order thinking skills needed to adapt to a rapidly changing, increasingly technological workplace. AC pathways expose students to exciting career opportunities in emerging science, technology, engineering and mathematics-related fields and equip them with he knowledge and skills needed to pursue advanced education and training and good jobs in STEM fields after graduating from high school.

Evaluation Purpose

SREB's Research & Accountability team conducts annual internal evaluations of our various program areas. The purpose of this Advanced Career program evaluation was to measure fidelity of program implementation, identify common characteristics of high performing AC sites, and provide program staff with actionable insights on what was working well and what was posing challenges to successful program implementation.

AC Core Pedagogy

- Plan authentic, intellectually demanding PBL units in which students master essential content and skills.
- Partner with business and postsecondary leaders to plan, implement and reflect on PBL units.
- Engage students in a collaborative problem-solving process.
- Foster a classroom environment that supports student ownership of learning.
- Promote sustained in-depth inquiry.
- Offer students ongoing, purposeful feedback and opportunities to revise and reflect on their work.

Figure 1. The Advanced Career Logic Model.
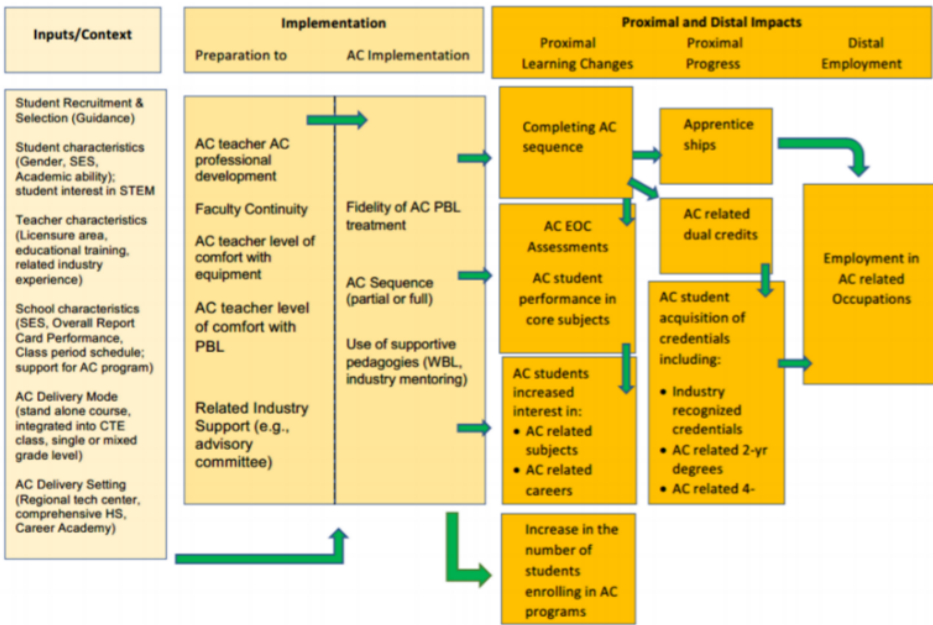
Evaluation Design

Evaluation Questions

1. To what extent were AC career pathway curricula implemented with fidelity?
2. To what extent are measures of fidelity of treatment associated with academic and career pathway-related student outcomes?

Methodology:

- Surveys of AC students and teachers
- Results from AC end-of-course assessments
- Interviews with a random sample of teachers
- Case study observations

Quantitative Survey Measures:

- **Student demographics** - Measured using variables around gender, race and socioeconomic status, using mother's level of education as a proxy.
- **Student academic background** - Measured based on student self-reported data on grades received for all courses taken, whether students completed honors courses and whether students completed Algebra I in middle school.
- **Student self-efficacy** - Measured by four items including the extent to which the student felt prepared for success in high school.
- **Student effort** - Measured by questions regarding completion of assignments, students trying to do their best work and whether students felt challenged by the course.
- **Fidelity of treatment** - Measured through a series of student survey items: student participation in work-based learning activities, the teacher's primary method of delivering information (lecture, student collaboration, etc.) and specific instructional activities prescribed for use in an AC course.
- **Fidelity of implementation** - Measured by teacher survey items including the number of AC projects completed during the course and the course period length.
- **Assessment of the course** - Measured by students' experiences within the course, whether they would recommend the class to a friend and if the course encouraged them to continue their studies in their AC career pathway.
- **Teacher background** - Measured by examining teacher self-reported data on length of service, length of teaching AC courses, teaching certification and primary teaching area.

Evaluation Question 1 - Findings

Figure 2: Percentage of Schools Offering Courses 1-4 in an AC Pathway
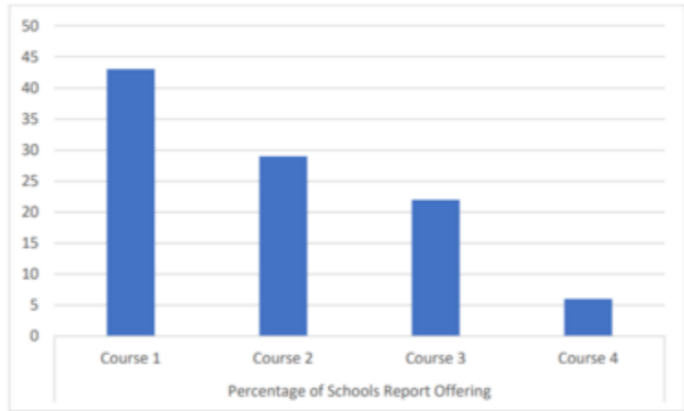
Source: SREB Spring 2019 AC Teacher Survey (2018-2019)

Figure 2: Most students are not completing the full four-course pathway.

According to teacher survey results, 86 percent of AC courses are delivered as a stand-alone course instead of as a four-course pathway. As a result, students are not completing their AC pathways. When AC teachers leave the school due to retirement or other job opportunities, they often are not being replaced, leaving the school to focus on Courses 1 and 2 or simply close the program.

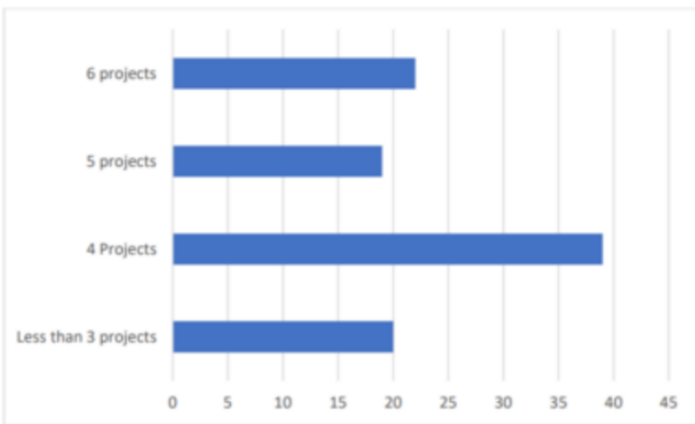Figure 3: Average Percentage of Projects Completed

Figure 3: Most students are not completing the recommended number of projects.

Most AC classrooms do not appear to be completing all six projects in each recommended AC curriculum. Surveys showed that many teachers do not have the AC course pacing down: 60 percent of respondents claimed they felt either not at all prepared or only somewhat prepared to deliver the recommended number of projects. Further, many students are struggling to master the basic math, science and literacy skills needed to keep up in the course. Approximately 50 to 60 percent of students reported having not yet taken Algebra I or an honors-level science or English course.

Figure 4: Percentage of Schools Offering Dual Credit, Work-Based Learning and Industry-Recognized Credentials
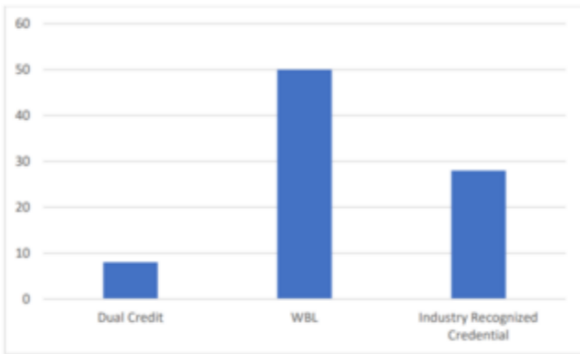
Figure 4: Schools lack postsecondary pathway connections.

Most AC career pathway programs have not developed the components of AC that reflect a true value-added for schools. Only 31 percent of teachers reported that their school had a postsecondary pathway connection for their AC course. Over half of interviewed teachers reported that they struggle to find industry partners, citing business and industry's misperceptions of AC course content and their own inability to deliver a sincere "sales pitch." Seventy-three percent of teachers did not hold an industry certification in the career field of their AC pathway. This could potentially hinder industry partners from recognizing the program's legitimacy.

Evaluation Question 2 - Findings

Table 1: Significant Predictors of Students' EOC Assessment Scores

Independent Variable	Expected Increase in EOC Assessment Scores Per Unit Increase in Independent Variable (%)	Statistical Significance
Male Students	4.0	0.00
Race/Ethnicity	2.5	0.05
Student completed Algebra I in eighth grade	4.4	0.00
Self-reported student grades in all courses	3.8	0.00
Teacher used AC equipment in accordance with curriculum	8.8	0.00
Teacher felt prepared to use motivational techniques as a result of participating in STTI	-3.0	0.00
Number of years teacher has taught AC	-3.7	0.00
Number of AC course projects completed	4.2	0.00
Length of AC course period	2.6	0.00
AC course research and design activities	1.2	0.00

Source: SREB Spring 2019 AC Teacher and Student Surveys, (2018-2019)

Students whose teachers used the required equipment in accordance with AC curricular guidelines could be expected to score almost nine percentage points higher on the assessment than students whose teachers did not. Students who completed at least four course projects, as well as students with longer course periods, also performed higher on the assessment. Incorporating the AC research and design components into course work led to a 1.2 percent increase in student scores. Conversely, students whose teachers felt well-prepared to use motivational techniques after participating in preparatory training program (STTI) could be expected to score three percentage points lower on the assessment. Additionally, more years of experience teaching AC correlated with a decrease in student assessment scores.

Table 2: Factors Influencing Students' Desire to Pursue Further Studies in Their AC Pathway

Independent Variable	Positive or Negative Influence	Statistical Significance
Student found the AC course to be exciting	Positive	0.00
Student tries to do his or her best work in all courses	Negative	0.02
Number of years teacher has taught AC	Negative	0.03
Student sees connection between courses and potential careers	Positive	0.00

Source: SREB Spring 2019 AC Teacher and Student Surveys, (2018-2019)

Students who found the AC course exciting and students who saw a connection between their courses and potential careers were more likely to report that they wished to pursue further studies in their AC field. Students who tried to do their best work in all courses, as well as students whose teachers had been teaching AC longer, were slightly less likely to want to continue further studies in the field.

Conclusions

As a result of this evaluation, the team created the following conclusions:

1. **AC sees success in varied environments.** There is not one clear formula for implementation, meaning that the program can be successful in a variety of settings.
2. **Student background characteristics are a strong predictor of student performance in AC courses.** Students who had taken more rigorous courses were more likely to succeed in AC.
3. **Limited school-level marketing** of the program to students hinders AC's success and potential to spread.
4. **Teachers need ongoing professional development and feedback on PBL.** Many teachers struggled with implementing PBL practices and tended to move away from the practice during the school year.
5. The highest-performing sites tended to have **strong industry partnerships** with the program.
6. **AC teachers and students need to be selected thoughtfully.**
7. **AC career pathway programs have struggled to mature after Courses 1 and 2.** Few sites have implemented the third and fourth courses of the program of study.
8. **The number of AC projects completed are inconsistent across programs,** with many students only completing a few of the required projects.
9. **AC courses have a limited effect on students' desire to continue in the same career field.**

Impact of Evaluation

The findings from this evaluation are still being reviewed and implemented by the AC team. To date, the team has already made some changes based on the recommendations:

1. The AC team has created a repository of resources using The Teaching Channel.
2. The STTI training sessions are now more focused and streamlined to lessen the time commitment and improve the impact.