

Credit that Counts: The Facilitator Model for Dual-Credit First Year Design Coursework (WIP)

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Introduction

Many dual credit opportunities are available for secondary students; however, it is rare that they are offered through four-year research-intensive universities, specifically regarding first-year design courses. Further, when early college credits are earned or transferred to these universities, they often fall outside the student's plan of study, or count as elective credits, doing little to reduce their workload while in college [1]. This paper, however, highlights a novel case of a dual credit model, referred to as the facilitator model, for first-year design courses. The case presented outlines procedures for developing and implementing such a model within engineering and technology programs. While this may not be the same process at each university, hopefully this provides some guidance to help navigate such a task. The facilitator model is a relatively new model for dual credit that was recently piloted with a cohort of high school juniors and seniors [2]. For this pilot, the model not only offered directly transcribed college credit for a core-requisite course to over 30 engineering/technology majors, but it also helped to navigate the institutional barriers often faced by traditional dual credit models.

While there are multiple reasons why universities may not accept dual credit earned by high school students [3]–[6], especially when replacing core-requisite course requirements, the facilitator model can address two that are most cited. First, a quality control perspective that high school teachers do not have the same qualifications as instructors at the university. Second, that while the content may be adequate, the methods of delivery and instruction may vary, leaving the students ill-prepared for upper-level classes that are meant to build on those methods. However, the facilitator model offers a unique approach to dual credit with the following three key features: engaging secondary teachers in facilitating university curriculum, introducing an instructor of record from the university to collaborate consistently with the secondary teachers and act as a liaison between the high school and college, and assigning a grader from the university to assess achievement and provide a means for students to earn directly transcribed college credit. This model addresses many of the suggested challenges to current dual credit models, including ensuring credit transfer and articulation, affordability, accessibility, collaboration with the high school and college, and student supports [7]. By addressing these barriers, successful incorporation of this model is likely to influence an increased enrollment and success of all students, including advancing equity for low-income and minoritized youth. In addition, this model is found to be a viable strategy for university recruitment as once high school students are enrolled, they can become more familiar with the university and its processes—likely promoting matriculation to the institution [8]–[10].

This report outlines key steps taken to implement such a model with two urban schools from conception to completion. Suggested supports to maintain the program through professional development and ongoing support throughout the school year are derived from a qualitative case study that explored the needs of teachers as “facilitators” of the college curriculum. Over 90 hours of qualitative data were analyzed from five high school teachers including interviews, focus groups, observations, and questionnaires. Both axial coding techniques and code-recode procedures were used to analyze the data.

Implementation of this model is expected to increase access of underrepresented students to dual credit programs and remove barriers toward implementing college level courses in schools with the required level of fidelity. Results can help to identify preparatory steps, professional

learning, and ongoing supports that are viewed as essential for sustaining such a program, with implications for higher education in adopting and scaling up facilitator model course offerings, specifically in engineering and technology disciplines.

Background & Research Question

Establishing a dual credit program for directly transcribed credit requires dealing with academic bureaucracy that may not have been originally designed around teaching collaborations outside of campus. This may be attributed to 4-year research intensive universities not typically offering dual credit coursework from their main campuses. Offering these types of programs may not be typical due to the policies related to offering dual credit such as a) teacher qualifications that could impact an institution's accreditation, b) a lack of interest in offering such experiences due to the minimal financial incentives with the reduced tuition, c) the belief that high schools cannot deliver the quality or rigor of instruction that the university can offer, and/or d) minimal interest in university faculty participation as the institution may not readily count the offering of the course within their normal course load (meaning offering the dual credit course would not be credited toward their workload) [4]–[6].

While some programs exist to provide dual credit opportunities, they may leave students dissatisfied with their experiences. For example, Taylor and Pretlow [1] found that dual credit students often feel disconnected from their peers and teachers, and often the promise of college credit falls short of their expectations. Students under the assumption that the credits they accumulate in high school will help to reduce their time to college degree are often disappointed to find that their credits did not count as they are not part of their plans of study as they enter postsecondary education [1], [3].

A relatively new model for obtaining dual credit that addresses many of these concerns is the facilitator model. In this model, high school teachers receive summer professional development from, and work closely with, faculty from a four-year university to facilitate a current university course offering. High school students complete course objectives as students enrolled at the university, while receiving feedback from a university instructor of record who grades key assignments and projects, while the high school teacher facilitates the course content within the school during the school day. A university faculty member serves as the instructor of record, ensuring a direct transfer of credit while working with high school teachers weekly, ensuring a fidelity of implementation while reducing teacher requirements, such as a master's degree in the content area, to offer the course. This means that the facilitator model can support broader access to dual credit programs, especially ones that provide transcribed college credit. This model has shown promise in college-level math education [8]–[10], and recently in a first-year design course [2]. Thorne [2] found that the facilitator model provided a structure in which teachers had success with a very hands-on, project-based first year design curriculum while piloting during the Covid pandemic, such that all students completing the course earned at least a grade of a "B" with work assessed through the cooperating university. This success in the face of adverse teaching conditions speaks to the potential strength of implementing such a model.

With all the potential advantages of new dual credit models, and all the institutional barriers to breaking from tradition, how does one introduce a new, innovative model? Which courses do you choose to pilot? With whom do you need to gain approval? How do you bring in schools and teachers? While the exact process may vary from one college to the next, this study investigates one university's process in adopting such a model. The research question that guided this study was:

RQ. What is the process for adopting and implementing a new dual credit model for first-year design coursework at a four-year, research-intensive university?

While the specific process for implementing a facilitator model for design coursework will likely differ from university to university, seeking to answer the posed research question can provide valuable insights for others when attempting to establish similar programs. This specifically includes programs aimed toward removing barriers to participation in early college coursework and providing meaningful opportunities for all students, including advancing equity in dual credit for low-income and minoritized youth.

Data used to answer this study's research question follows the process used in implementing a first-year design course for dual credit using the facilitator model at a four-year research-intensive university. The course chosen for dual credit is the first, and only dual credit design course offered by the main campus and was piloted with two innovative urban public charter schools located within high need areas. The facilitating high school teachers for this program were engineering technology instructors. The design course did not have any pre-requisites, which enabled the high school students to enroll in the course, and it did not require equipment/materials beyond that of a typical high school engineering technology classroom. Additionally, the chosen course was well aligned with pre-existing engineering technology high school course objectives from the state department of education such that a new course was not created, but instead aligned to the pre-existing engineering technology curriculum. The process of gaining approval took place in the fall of 2019, however professional development and piloting of the course occurred during a global pandemic. While the focus of this report is on the approval process, details on course experience and outcomes can be found in research by Thorne [2].

Findings

In initiating a dual credit course offering, the program started with establishing a rationale and potential outcomes for doing so. The goal was to provide opportunities and the support necessary for an early college pathway for urban, underserved populations that could be scaled across the state. The desired outcomes included 1) supporting students in transitioning to a large university while they are still in high school, 2) providing a true connection between high school students and the university, 3) making progress toward a degree by earning direct credit, 4) gaining experiences that directly relate to college life at a large institution, and 5) likely, according to research [6], [11]–[17], perform better on campus. After establishing and agreeing on rationale and outcomes, a timeline was drafted for recruiting schools, providing onboarding training to teachers, and implementing the course.

In addition to earning direct credit, a first-year design course was selected to make progress toward a degree. A course outline is provided in Appendix A. The course is specifically offered through the engineering technology college, is a core-requisite for multiple majors, fulfills one of the university's core curriculum learning outcomes, and is one of three courses required for a specialized minor degree in design and innovation. Goals and outcomes were presented to the first-year design course coordinator, and approval was granted to continue pursuing a dual credit pathway. With goals, outcomes, and a course in mind, the program team reached out to, and gained confirmation of, two innovative urban public charter schools' interest in initiating a dual credit partnership.

Next, conceptual approval was obtained from the college dean, office of admissions, and provost. Meetings were arranged with each individually, and drafts of the timeline, goals, and outcomes were shared. While this was the first interaction with the office of admissions,

communication with this office was continued throughout the process of drafting and approving a new application and admissions process.

After conceptual approval by the college dean, provost, and admissions, institutional approval was obtained from the registrar, bursar, and board of directors. In addition to sharing the implementation timeline, goals, and potential outcomes, the program provided concerns raised from meetings in conceptual approval, and how the team planned to address each concern. Tuition rates required by the state for dual credit programs (\$25 per credit hour) were presented and approved by the board of directors, and the bursar established that we would follow the standard university schedule for fees and refunds.

Time was then dedicated to travelling to each school to meet with teachers who would be piloting the course to gain a better understanding of the facilities, teaching methods, and appropriate professional development for onboarding. Professional development took place that summer and lasted for four days, providing teachers with a broad overview of the course, student exemplars, and calibration of grading expectations. Communication with teachers continued weekly throughout the school year as an “instructor of record” from the university met with each school for roughly one hour each week, and student work was assessed by a grader from the university as well. The course was considered part of the course load for the instructor of record with the support of a graduate student compensated at 0.25 time, with the cost offset by student tuition. This graduate student supports summer and ongoing professional development, as well as enrollment of the students.

Teachers followed the curriculum guide with class lesson and projects, while students applied recommended changes from initial teacher feedback to submit finalized work through the university learning management system. After the pilot, teachers indicated feeling well connected to the university and supported throughout an otherwise challenging semester during a global pandemic. Teaching expectations were reflected in student outcomes, all earning at least a B at the conclusion of the course, granted as directly transcribed credit. This is to say that sophomore, junior and senior students completing the course received a transcript from the university with no requirements or matriculation agreement to enroll at the university to receive their credits, leaving post-secondary options open. However, outside of the course the school has agreements with the university that provides preferred admittance to 9 out of 10 colleges in the university.

Recommendations

Based on implementations and lessons learned, here are some recommendations when launching a similar program. First, before scheduling meetings or bringing in other individuals, one should start by questioning *why* implementing such a program is important. These outcomes should be accompanied by a rough but realistic timeline for piloting such a program. Identifying tangible outcomes as a first step is essential for communication of the need and realistic goals of implementation.

While this case study started early in the process of finding partnering schools, it is recommended to wait until after the dual credit course is approved to establish this connection. This is largely in response to the time it takes from course, to conceptual, to institutional approval, with any fumbles along the way delaying or negating the process. It is, however, recommended to identify several potential schools to partner with early in the process, and rationale for each to aid in discussions at each approval level.

After developing a strong rationale, identifying an appropriate course for implementation should be the next concern (see Fig. 1). This includes curriculum that is well suited for

implementation at the secondary level and a course coordinator that is willing to provide broad access to their curriculum. Perhaps the most suitable courses are first-year courses, as these are designed with limited assumptions to the students' prior knowledge, starting at a ground level. It is also worth considering what special facility accommodations and resources are required for facilitation of the course, if these resources are consumables or equipment, and any special training that may be required to use such equipment.

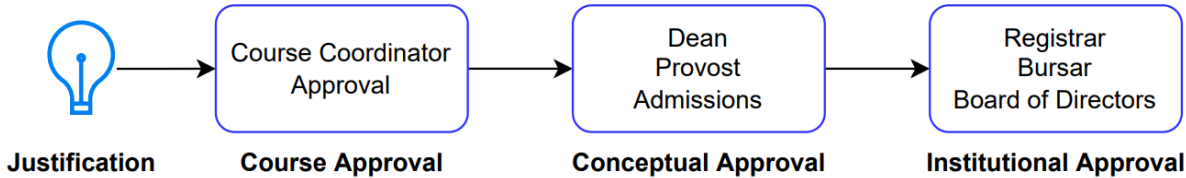


Fig. 1. Process for Dual Credit Course Approval

After securing course approval, one may proceed to gain conceptional approval. This starts with the dean of the course coordinator's college, and proceeds to the provost and office of admissions. Reviewing the rationale and objectives before each meeting is seems necessary to be prepared to answer questions regarding potential benefits to students as well as the university. The office of admissions plays a key role at this stage, as they will outline requirements for the process of application and admission. At this point one should also have an idea of what supports you may need from the university. Considerations may include cost of travel to schools for a performance or learning context analysis [18], resources and location of professional development for facilitating teachers, and a cohort of representatives from the university to serve as instructor of record, liaison, and grader for the course. There are likely to be several questions when gaining conceptual approval, but not all have to be answered at once. Take note of each of the questions or concerns as well as where they came from and follow up in a timely manner.

Once conceptual approval is received, one can move to the final step of institutional approval. This involves the registrar, bursar, and board of directors. It will be important at this stage to provide collected evidence to show the potential impact of such a program, goals, objectives, and the widespread support from course coordinators, academic deans, the provost, and the office of admissions. Share responses to concerns and questions raised in conceptual approval, as individuals at the institutional stage of approval will likely share similar questions. Providing the rationale for why a particular curriculum is chosen, sharing a projected timeline for implementation, and listing the accommodations needed for implementation, are necessary for institutional approvals and ensuring a successful implementation.

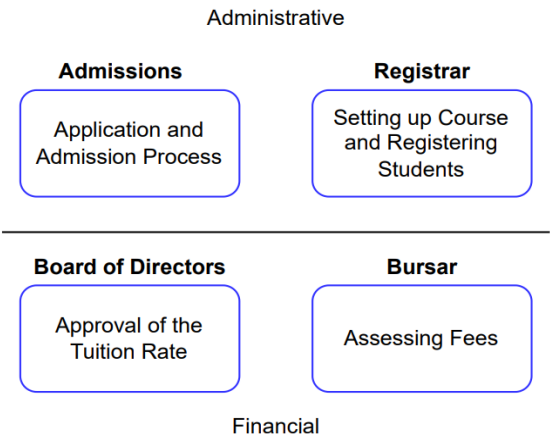


Fig. 2. Departmental Roles in Establishing a Dual Credit Course

If considering a facilitator model, there are several advantages in planning professional development. Because instructors from the university will continue to work with teachers throughout the school year, the initial summer professional development may provide an overview of complicated procedures in the course, without having to go into depth with information teachers may not use for several months. The time can instead be focused on establishing rapport while

making sure teachers have a big picture view of the course, are confident in navigating lesson plans, and are calibrated with scoring assignments with provided rubrics. While using the facilitator model also means dedicating a liaison from the university to meet throughout the semester with participating schools, this should also be viewed as an advantage as it addresses barriers identified by multiple studies [4], [15], [19]– [22]. In addition, this model seems to be an appropriate approach to effectively scale the offering of more hands-on, design-based courses with more students at an early level. It should also be reiterated that while the facilitator model outlined in this study focused on engineering technology classrooms, collaborations with schools and approach to navigating dual credit barriers have been found to be effective in areas of math and majors beyond engineering [8]–[10].

Conclusion

This study investigated the process for adopting and implementing a novel dual credit model at one four-year, research-intensive university for a first-year design course. Based on the results, the process for implementing the facilitator model for dual credit, while multi-faceted and likely consisting of different approvals/requirements across institutions, was divided into a general and linear approach. This approach includes 1) justifying why a dual credit model should be implemented for a specific college, 2) securing course approval, 3) obtaining conceptual approval, and 4) finally securing institutional approval. Additionally, investing time and resources in models such as the facilitator model seems to provide a means for navigating barriers of entry to dual credit coursework—potentially promoting access and academic success for more students as well as advancing equity in educational experiences for low-income and minoritized youth. The facilitator model can promote a strong rationale for initiating a meaningful dual credit program as it ensures credit transfer and articulation, affordability, accessibility, supports for students, and ongoing collaboration between high school and college instructors, safeguarding that students earn credit that counts.

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Appendix A

Table A

Design Course Outline

Course Introduction & Project 1	
Lesson 1: Low-Res Prototyping	Lesson 3: POV = Empathy
Lesson 2: Design Thinking & Innovation	Lesson 4: Design Critique
Project 2	
Lesson 5: Project 1 Reflection Introduce Project 2	Lesson 9: Solution Evaluation
Lesson 6: Prob. Definition and Fieldwork Planning	Lesson 10: Ideation & Solution Identification
Lesson 7: Research	Lesson 11: Demonstrate
Lesson 8: Emerging Themes	
Project 3	
Lesson 12: Project 3 Transition	Lesson 20: Prototype Planning and Development
Lesson 13: Global Grand Challenges	Lesson 21: Peer Critique of Prototype & Testing
Lesson 14: Problem Definition	Lessons 22 - 23: Small Group Conf. & Data Testing
Lesson 15: Benchmarking	Lesson 24: Functional Prototype Iteration
Lesson 16: Work Week	Lesson 25: Finalization & Realignment
Lesson 17: Fieldwork	Lessons 26 - 28: Presentation and Delivery
Lesson 18: Ideation	Lesson 29: Course Reflection
Lesson 19: Solution Analysis	