

Career Enhancement Grant: Computer Programming

1. Describe the program improvement plan's alignment to the appropriate institution or building plan(s). For all program improvement plans which are multi-year in length, explain the connection the funding request has to enhanced or augmented instruction during the grant period, and to longer term improvement for the program and either institution or building plan(s).

With this grant money, we are seeking to systematically expand/enhance our current course offerings to students with the express purpose of preparing them for post-secondary options that match their career interests. Each of our expansions/enhancements will provide a pathway for a student to eventually earn possible college credit and/or an industry credential. Our district is making enhancements in several areas, including engineering, biomedical science, culinary arts and business technology. We have redesigned our business course offerings into clear pathways leading to certifications, IRC/TSAs and/or dual credit rather than a myriad of classes without an end goal. These pathways will be: Accounting & Finance, Marketing & Entrepreneurship, Programming, Networking and Video/Broadcasting. For the purposes of this grant, we are seeking to enhance our programming courses by providing new technology that will enhance our revised curriculum.

We know, based on ACT career interest survey results for the past three years that business is consistently in the top three career pathways of interest among our students. While we have offered a variety of business courses, they were in need of modernization and were not preparing our students to the current market needs in order to be college/career ready. The realignment/revision of coursework provides clear pathways for students that build skill and knowledge which result in a credential or recognition.

As students complete a pathway, they will be able to earn an industry recognized credential and/or certification which will better prepare them for their post-secondary future. Students will start with Introduction to Computer Science which is a course that will provide each student foundational learning in the area of computer programming. Students will then be able to enroll in a Visual Basic and/or Java programming course as a way to learn more specialized skills. Once these courses are completed, students can enroll in a Java Programming 2 course and take the Java Level 1 certification assessment or enroll in the C++ course and take the C++ Certified Associate Programmer assessment. The programming pathway will continue to expand over the next three years to include Web Programming, Mobile App Development, Game Programming and Linux basics.

This plan falls in line with the visions of our high school's College and Career Readiness Work Group and our district Innovation Committee; both groups are committed to expanding course offerings at the high school in areas of occupational need and increased rigor. The College and Career Readiness Work Group includes district office administrators, building administrators and post-secondary institution representation. The district Innovation Committee

includes district administration, building administration (K-12), teachers (K-12) and community members.

The plan for these grant dollars aligns to the Raymore-Peculiar School District's multi-year strategic plan which was developed under the leadership of our superintendent and involving over fifty stakeholders, including administrators, certified and classified staff, Board of Education members and community members. The team developed eight focus areas and all work in the district is aligned to at least one of these areas.

The goals of our strategic plan directly aligned to this improvement plan are as follows:

- I. "We believe we must ensure the relevancy of educational programming for preparation of students for post-secondary opportunities." Computer programming coursework is absolutely relevant based on the job market needs of our society and the need for students to engage in critical thinking and problem-solving learning experiences in the technology field. By opening this opportunity up to all of our students, they will be better prepared for post-secondary opportunities in college and the workforce. Each year, more and more students will be able to access this learning to a deeper level as they continue to take courses within this pathway. Realigning business department coursework so it meets industry needs (especially in areas such as programming) allows students to complete industry-recognized certifications which will better prepare students for their futures.
- II. "We believe we must ensure an environment that is conducive to learning." Our business course realignment in the area of programming will also provide students with real-world opportunities as they create authentic programming and learn how to troubleshoot basic computer programming issues in our one-to-one environment. Students will be acquiring skills they can use in the workforce.
- III. "We believe we must maximize academic proficiency for all students." The programming curriculum and assessment allows students to participate in an intense, demanding, high level of educational excellence in the area of computer programming. The skills and knowledge students bring into the course will further be sharpened and enhanced through participation in the curriculum. Through this opportunity, students will be able to maximize their academic potential and challenge themselves and their peers. Students who complete a business pathway will be able to earn certifications and/or credentials that can be useful after they graduate high school.
- IV. "We believe we must maximize technology applications and resources to facilitate effective instructional delivery and student learning." Our business department seeks to use up-to-date technology and software currently being used in the computer programming industry. The teacher will attend training in C++. The training provided ensures the teacher knows how to best deliver instruction for optimum student learning. The curriculum seamlessly blends technology and instruction and will, again, prepare students to complete industry level certifications. Through the grant funds, we will improve the technology in

our programming courses so students are learning from the most up-to-date equipment and software for this endeavor.

2. Describe how each program to be funded will use measurable objectives to determine effective use of requested funding and to demonstrate successful rollout of the improvement plan for the grant period, and positive impact toward success of the institutional or building plan(s). Explain the extent in which the program improvement plan has determined the composition of allowable items to be funded by the grant.

During the 2015-2016 school year, a focus group was created to examine the Business Education program at Raymore-Peculiar High School. This team examined the industry needs in the Cass County and Kansas City areas relative to the program offerings at Raymore-Peculiar High School. It was determined that there is a human capital shortage of more than 26,000 open technology positions in the metropolitan area. The programming strand of the Business Education department has established a completion rate goal of 70% for students enrolling in the Introduction to Computer Science course to complete the program strand and earn an industry certification. This grant will provide the opportunity for program expansion to include Web Programming, Mobile App Development, Game Programming and Linux basics. Each of these courses is in alignment with the PLTW Computer Science program of study as outlined in the district's strategic plan.

Growing enrollment numbers and student achievement on the IRCs and industry certifications will be used to determine the success of the programming pathway over the course of multiple years. We will determine our baseline enrollment in Introduction to Computer Science (ICS) after spring enrollment conferences. We are anticipating approximately fifty students enrolling in the program and we will seek to expand that in the 2018-2019 school year. We will also monitor how many students from ICS enroll in Visual Programming to determine maintained interest in the programming field. Our baseline assessment data will be provided this spring. From there, we can set specific achievement growth goals with the initial goal being 70% attainment in the programming strand among our students.

To date, students are transported to area technical centers for advanced programming classes and enrollment is limited to the number of slots open and able to be financially supported. In addition, these slots are not solely for programming courses; they are also used for bio-medical and engineering courses thereby greatly reducing the number of students who can actually enroll in programming courses. In the past, the high school has not offered programming courses that led to industry certifications. Enrollment numbers and student success on the IRCs and industry certifications will be used to determine the success of the program over a multi-year process. The first year of enrollment and testing will serve as baseline data. Our advisory board will review this data and create specific benchmarks we will seek to reach in subsequent years. Goals would be focused on continuing to increase enrollment numbers and programming course offerings and steadily increasing the number of students who attain certification with 70% proficiency being the initial goal.

For all of our business programs, data and progress will be measured on a regular basis by the advisory committee. In addition, our district practices the data team process. Once

specific learning targets are designed, the teacher will be expected to track student achievement at the classroom level by analyzing pre/mid/post assessment data aligned to the targets. The items requested on the grant are aligned with the programming classroom needs so there is no question as to whether we have the appropriate items for optimal student learning. Items not covered in the grant will be purchased by the district.

3. Include a description of the improvement plan's measurable objectives for the grant period, and if applicable, longer term rollout of the plan. If the program improvement plan identifies objectives beyond the grant period, explain the correlation between those anticipated to be achieved during the funding timeline and those further into the future. Explain the extent in which the objectives will determine project success.

The ultimate measurable objective of the improvement plan is to increase the number of students who graduate college and career ready. As a part of this grant, we will offer a sequence of computer programming courses to our students in the 2017-2018 school year, starting with Visual Basic Programming, Java Programming 1 and 2, and C++. In 2018-2019, we will offer additional courses, including web programming, mobile app development and game programming. Future decisions will be based on the advice of the advisory board and student interest. Although not funded from this grant, we currently offer the two computer science courses at the middle school (this started in the 2016-2017 school year). We believe this will better prepare our students as they enter high school and generate increased interest in the computer programming area.

As a result of a locally developed curriculum based on state and industry standards and teacher training in the areas of programming and problem-based learning, we will be able to provide a relevant, academically challenging path for students that will prepare them for a variety of post-secondary options. We will use our initial year of enrollment as baseline data and seek to continue to increase this number in subsequent years with the specific intent to double enrollment numbers after the first year. The advisory committee will set reasonable yet challenging benchmarks to reach in regards to enrollment for future years and courses. In addition, we will administer industry recognized assessments to our students as an external measure of progress made and learning achieved. The first year will serve as baseline data and, again, the advisory committee will be charged with setting and monitoring measurable goals starting with the baseline. Many industries and businesses use IRC scores for student recognition opportunities. Finally, our district utilizes a balanced assessment approach and therefore formative and summative assessments are used at the classroom level. The teacher will monitor student achievement through the data team process as an internal measure of achievement.

4. Describe the eligible courses for which funding is sought by course name and CIP Code, what teacher will be providing instruction for each course, and designate in what building and room(s) instruction will occur for each funded course. Include a description of what is to be purchased for each course along with how these expenditures will address needed improvements and/or augmentation in the delivery of the eligible course(s) and student performance and/or learning.

Computer Programming

CIP Code 11.0103

Huey-Ru Strauss will be teaching this course; she currently teaches our computer applications and introductory programming courses and is therefore best suited to teach our programming courses under our new realignment. She will be teaching Visual Basic Programming, Java I & II Programming and C++.

We are building an addition to our current high school so that our students can be housed in one comprehensive building instead of them traveling between a two-building campus. The course will be taught at Raymore-Peculiar High School in one of our new business department rooms (522).

For this coursework, we will purchase up-to-date student computers and a teacher laptop. This equipment is needed in order to provide students with up-to-date, industry-level technology so they can be best prepared to learn about programming and acquire industry level credentials and certifications.

5. Describe any student performance and/or learning measures which be used to determine project success.

The courses will be evaluated using a variety of methods during the initial implementation year and subsequent years after. Results will be shared with building and district administration as well as the advisory board. In addition, regular updates will be provided to the Career and College Readiness Work Group and the Innovation Committee.

- I. Students who complete the computer programming sequence will take industry recognized assessments and the number of certifications attained will be tracked and analyzed.
- II. Throughout the school year, students will be assessed through the use of unit assessments; results will be used to plan for additional instructional opportunities as needed via our data team process.
- III. The teachers will be evaluated using the district's performance-based teacher evaluation tool as required by the state of Missouri and our local school board policies.
- IV. Data gained through assessments, hands-on labs and evaluations will be analyzed by advisory boards, teachers and administration.
- V. Students who complete the program will be surveyed for post-graduation work and/or education through the 180 day follow-up as required by the state.

6. Describe any relationship the program improvement plan and/or funding request has to specific industry credentials, including the development of such when none is presently available, and the potential for future career mobility for students.

In computer programming, there are industry recognized credentials and certifications. Students successfully completing the appropriate sequence of courses will take these

assessments. Passing these assessments would open doors for students in the workforce and better prepare them for postsecondary coursework. Students who earn programming credentials would be able to acquire a job almost anywhere in the United States.

Information technology is one of the top fastest growing industries in the Kansas City area. Currently there are over 26,000 information technology jobs in Kansas City and that number continues to grow each year. The projected growth in this field by 2023 is a 19.6% increase in jobs. The job potential for our current students is extraordinary. Jobs available are at all levels of education. Allowing students the opportunity to enroll in courses in the computer programming field and earn certifications in this field will better prepare them for the rigor of post-secondary education and the job needs of the region.

7. Describe the composition of the applying program's occupational advisory committee. Explain the extent the committee, building/district/institution administration, faculty and other key stakeholders were involved with the development of the program improvement plan and prioritization of the funding request.

The advisory board consists of building administrators, counselors, teachers and district level administration. In addition, we have business/labor leaders, parents, community leaders and senior citizen representation. Members are involved in creating plans and prioritizing goals for the future. Student interest is also considered in the development of plans. For the past three years, business has been in the top three career choices for our students according to their ACT interest surveys. Advisory board members will be a part of reviewing the progress of the implementation of programming courses in the high school and monitoring the success of the program through an analysis of enrollment numbers and assessment data. Eventually, members will also be able to review students' postsecondary decisions to determine if students who are a part of the programming pathway go to further their education and/or start working in high need, high paying careers.