

**U.S. Department of Education - EDCAPS
G5-Technical Review Form (New)**

Status: Submitted

Last Updated: 06/17/2019 05:47 PM

Technical Review Coversheet

Applicant: Project SYNCERE (U411C190108)

Reader #1: *****

	Points Possible	Points Scored
Questions		
Selection Criteria		
Significance		
1. Significance	25	22
Quality of Project Design		
1. Project Design	35	35
Adequacy of Resources/Quality of Management Plan		
1. Resources/Management Plan	20	20
Sub Total	80	77
Priority Questions		
Competitive Preference Priority		
Competitive Preference Priority		
1. Absolute Priority 3	5	0
Sub Total	5	0
Total	85	77

Technical Review Form

Panel #25 - EIR Early Phase Tier 1 - 24 - 1: 84.411C

Reader #1: *****

Applicant: Project SYNCERE (U411C190108)

Questions

Selection Criteria - Significance

1. The Secretary considers the significance of the proposed project. In determining the significance of the proposed project, the Secretary considers the following factors:

(1) The potential contribution of the proposed project to increased knowledge or understanding of educational problems, issues, or effective strategies.

(2) The extent to which the proposed project involves the development or demonstration of promising new strategies that build on, or are alternatives to, existing strategies.

Strengths:

The applicant provides adequate details to show the understanding of the problem by discussing that Project SYNCERE now provides opportunities to thousands of students in Chicago Public Schools (CPS) who have been traditionally underrepresented in STEM. In addition, to further support the understanding of education problems the applicant wrote that Project SYNCERE proposes to expand, refine, and evaluate its in-school project-based learning engineering curriculum, ENpowered. (pp. e21)

The applicant provides clear details to show the understanding of the problem by discussing that according to the Bureau of Labor, STEM-related jobs grew at three times the rate of non-STEM jobs between 2000 and 2010 and it was projected that by 2018, 2.4 million STEM jobs would go unfilled. (e22)

The applicant provides clear details to show the understanding of educational issues by discussing that according to the National Math and Science Initiative, the average US workforce is 48 percent women, but in STEM careers women make up only 24 percent. (e22)

The applicant also provided clear details to show that the proposed project involves the development of promising new strategies by writing that the ENpowered Program highlights a new and exceptional approach to solving our STEM crisis through a combination of research-based strategies because it provides students with engineering project-based lessons that are connected to a real-world project to make learning relevant for the students. (e25)

The applicant also provided compelling details to show that the proposed project involves the development of promising new strategies by discussing that the ENpowered Program is based on a PBL framework that is utilized to drive connections of the engineering challenges students work on to real-world issues, and also helps to connect student learning to other subjects involved in the project such as math and science. (e25)

Weaknesses:

The applicant did not provide details to show how staff will be trained in Project Based Learning strategies. (pp. e21-e25)

Reader's Score: 22

Selection Criteria - Quality of Project Design

1. The Secretary considers the quality of the design of the proposed project. In determining the quality of the design of the proposed project, the Secretary considers the following factors:

- (1) The extent to which the goals, objectives, and outcomes to be achieved by the proposed project are clearly specified and measurable.
- (2) The extent to which there is a conceptual framework underlying the proposed research or demonstration activities and the quality of that framework.
- (3) The adequacy of procedures for ensuring feedback and continuous improvement in the operation of the proposed project.

Strengths:

The applicant provided very clear goals, objectives and outcome measures. For example, the applicant discussed their goal of training and supporting Project SYNCERE instructors to implement the curriculum with fidelity with the objective of Project SYNCERE training and supporting its engineering instructors to successfully implement the curriculum covering pedagogical content knowledge. (pp. e33, e34)

There is clear evidence provided to show the underlying conceptual framework of the project by the applicant providing a logic model which shows key components such as inputs that show resources to be used in support of the project and outputs that show the size and scope of tangible products that will be delivered. (e54)

The conceptual framework of the project is compelling because the applicant provides details to show that the ENpowered Program is an informal STEM program that combines the key components of a PBL engineering-based curriculum, mentor engagement, engineering professionals and students as instructors, and the benefits of a competition. (pp. e29)

The applicant provided adequate details to show feedback and continuous improvement by discussing that these mechanisms consist of bi-weekly program meetings, weekly instructor site check-ins, bi-monthly classroom observations and bi-weekly management meetings. (pp. e34)

To show strong evidence of providing feedback the applicant also wrote that Project SYNCERE will provide evaluation results to participating schools and corporate partners and will also disseminate research results through our organizational communication platforms including sharing results on social media, their website, and sending highlights to Project SYNCERE's email list. (pp. e35)

Weaknesses:

None noted.

Reader's Score: 35

Selection Criteria - Adequacy of Resources/Quality of Management Plan

1. The Secretary considers the adequacy of resources and the quality of the management plan for the proposed project. In determining the adequacy of resources and quality of the management plan for the proposed project, the Secretary considers the following factors:

(1) The adequacy of the management plan to achieve the objectives of the proposed project on time and within budget, including clearly defined responsibilities, timelines, and milestones for accomplishing project tasks.

(2) The qualifications, including relevant training and experience, of key project personnel.

(3) The potential for continued support of the project after Federal funding ends, including, as appropriate, the demonstrated commitment of appropriate entities to such support.

Strengths:

The applicant provides a strong management plan that includes milestones and timelines related to recruiting partners from August to October Year 1 by project staff and co-manager. (pp. e35)

Adequate evidence is provided by the applicant to show persons responsible and activities to be accomplished. For example, the applicant wrote that the co-managers will oversee data analysis, dissemination of project information, ,a and submit final reports to the US Department of Education. (pp. e37)

Clear details are providing to show experiences of key project personnel. For example, the applicant wrote that the Executive Director and Co-Founder of Project SYNCERE will oversee and manage the grant. IN addition, the Executive Director is a veteran engineer and STEM leader, and has raised over \$6 million dollars over the last 10 years to implement the activities of Project SYNCERE. (pp. e37)

The applicant also provides strong details to show experience of another key staff member by describing the Program Director, will manage the implementation of the project and oversee its deliverables. In addition, the project director is an engineer by training has over 9 years of STEM programming experience and more than 5 years of design, evaluation and oversight of STEM programs. (pp. e37)

Clear details are provided by the applicant to show sustainability of the program beyond the life of the grant by discussing that the project will continue through the support of their corporate and other philanthropic partners. To further show sustainability the applicant wrote that many of their companies already provide financial support to their organization and the additional ones that they secure during this grant period will have the potential to become future funders of the project. (pp. e39)

Weaknesses:

None noted.

Reader's Score: 20

Priority Questions

Competitive Preference Priority - Competitive Preference Priority

1. Within Absolute Priority 3, we give competitive preference to applications that address the following priority:

Projects designed to improve student achievement or other educational outcomes in computer science (as defined in the notice). These projects must address the following priority area:

Expanding access to and participation in rigorous computer science (as defined in the notice) coursework for traditionally underrepresented students such as racial or ethnic minorities, women, students in communities served by rural local educational agencies (as defined in the notice), children or students with disabilities (as defined in the notice), or low-income individuals (as defined under section 312(g) of the Higher Education Act of 1965, as amended).

Note: Projects addressing this priority must be administered in a manner consistent with nondiscrimination requirements contained in the U.S. Constitution and Federal civil rights laws.

Strengths:

None noted.

Weaknesses:

Not applicable

Reader's Score: 0

Status: Submitted

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Technical Review Coversheet

Applicant: Project SYNCERE (U411C190108)

Reader #2: *****

	Points Possible	Points Scored
Questions		
Selection Criteria		
Significance		
1. Significance	25	23
Quality of Project Design		
1. Project Design	35	35
Adequacy of Resources/Quality of Management Plan		
1. Resources/Management Plan	20	20
Sub Total	80	78
Priority Questions		
Competitive Preference Priority		
Competitive Preference Priority		
1. Absolute Priority 3	5	5
Sub Total	5	5
Total	85	83

Technical Review Form

Panel #25 - EIR Early Phase Tier 1 - 24 - 1: 84.411C

Reader #2: *****

Applicant: Project SYNCERE (U411C190108)

Questions

Selection Criteria - Significance

1. The Secretary considers the significance of the proposed project. In determining the significance of the proposed project, the Secretary considers the following factors:

(1) The potential contribution of the proposed project to increased knowledge or understanding of educational problems, issues, or effective strategies.

(2) The extent to which the proposed project involves the development or demonstration of promising new strategies that build on, or are alternatives to, existing strategies.

Strengths:

Project SYNCERE contains the added element of a competition among students (ENpowered Games). This gives students the opportunity to show their new skills and to see that other, similar students are also interested in STEM (p327). Students need to see that others like them are also interested and succeeding in STEM fields. The project has already been initiated. This grant will expand the offering to additional schools in the Chicago area. (page e21)

This application, while expanding the program to 7 additional schools, serving an additional 600 students (150 students/year), will also create four new curriculum modules. (pages e29 – e30)

Project SYNCERE proposes to collect data from both participating and non-participating schools to determine the effectiveness of these new strategies. (page e34)

Students will meet engineering professionals and work alongside them throughout the program. Teachers will also be assisted by college students in their junior year who will work as Engineering Program Facilitators (EPFs). (page e32) Providing students with the opportunity to meet and work with engineering professionals introduces students to the concept of engineering as a possible career choice. These high need students would not otherwise see adults in STEM careers.

This program will serve high need 6th grade students, introducing them at an early age to engineering professionals and providing them with an opportunity to collaborate with other students to showcase their skills in a competition. The opportunity to engage collaborate with other students enhances learning. The opportunity to showcase their skills provides recognition for student efforts and helps students to see the viability of STEM as a possible career choice.

Weaknesses:

Proposal is limited to 6th graders in Chicago schools. There is no provision to provide additional experiences as these students progress to higher grade levels.

There are no plans to expand this project beyond the local Chicago area.

Selection Criteria - Quality of Project Design

1. The Secretary considers the quality of the design of the proposed project. In determining the quality of the design of the proposed project, the Secretary considers the following factors:

- (1) The extent to which the goals, objectives, and outcomes to be achieved by the proposed project are clearly specified and measurable.
- (2) The extent to which there is a conceptual framework underlying the proposed research or demonstration activities and the quality of that framework.
- (3) The adequacy of procedures for ensuring feedback and continuous improvement in the operation of the proposed project.

Strengths:

- (1) SYNCERE proposes to develop four 10-week curriculum units that utilize a PBL framework, are connected to real-world issues and address NGSS standards and Common Core standards for math. Training and support for instructors is included along with recruiting plans for corporate partners. (ppe33-34)
- (2) The project incorporates a detailed logic model (Appendix G) identifying Inputs, Activities, Outputs, Outcomes (short term and intermediate term), and Impact (long term). The model is detailed and provides appropriate sequencing of activities in support of the overall goal to increase student interest in STEM. (page e54)
The project incorporates Project Based Learning (PBL).
- (3) SYNCERE includes mechanisms to ensure feedback and continuous improvement by collecting comments from the mentors (engineering professionals) and teachers after each session. This feedback will be reviewed at bi-weekly program team meetings. (page e36) Bi-monthly classroom observations will also provide feedback for continuous improvement. These are ongoing activities throughout years 1 – 4, culminating in the formal evaluation in year 5. This combination of bi-weekly, monthly and bi-monthly feedback should ensure continuous improvement throughout the project.

Weaknesses:

This reviewer found no weaknesses in the Quality of the Project Design.

Selection Criteria - Adequacy of Resources/Quality of Management Plan

1. The Secretary considers the adequacy of resources and the quality of the management plan for the proposed project. In determining the adequacy of resources and quality of the management plan for the proposed project, the Secretary considers the following factors:

- (1) The adequacy of the management plan to achieve the objectives of the proposed project on time and within budget, including clearly defined responsibilities, timelines, and milestones for accomplishing project tasks.
- (2) The qualifications, including relevant training and experience, of key project personnel.
- (3) The potential for continued support of the project after Federal funding ends, including, as

appropriate, the demonstrated commitment of appropriate entities to such support.

Strengths:

- (1) This proposal contains a detailed management plan for all five years (page e36). The plan details responsibilities of key personnel on a bi-monthly or quarterly basis for years 1 – 4. Year 5 is devoted to data analysis and dissemination of results by appropriate personnel.
- (2) The Executive Director and Program Director are both former engineers with experience in STEM programming (page e37). The Program Managers, Director of Marketing and Development, Operations Coordinator, Director of Operations and Lead Evaluator all have relevant experience and are well qualified as indicated through their resumes (Appendix B).
- (3) Appendix C contains Letters of Support from schools and corporations. Project SYNCERE already receives financial support from industry partners and proposes to recruit additional industry partners as they recruit volunteer mentors.

Weaknesses:

This reviewer found no weaknesses in the Adequacy of Resources or in the Quality of the Management Plan.

Reader's Score: 20

Priority Questions

Competitive Preference Priority - Competitive Preference Priority

- 1. Within Absolute Priority 3, we give competitive preference to applications that address the following priority:

Projects designed to improve student achievement or other educational outcomes in computer science (as defined in the notice). These projects must address the following priority area:

Expanding access to and participation in rigorous computer science (as defined in the notice) coursework for traditionally underrepresented students such as racial or ethnic minorities, women, students in communities served by rural local educational agencies (as defined in the notice), children or students with disabilities (as defined in the notice), or low-income individuals (as defined under section 312(g) of the Higher Education Act of 1965, as amended).

Note: Projects addressing this priority must be administered in a manner consistent with nondiscrimination requirements contained in the U.S. Constitution and Federal civil rights laws.

Strengths:

Not applicable.

Weaknesses:

Not applicable. The activities in this project seem to involve exposure to computer programming but the proposal does not mention computer science.

Reader's Score: 5

Status: Submitted

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Status: Submitted

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Technical Review Coversheet

Applicant: Project SYNCERE (U411C190108)

Reader #3: *****

	Points Possible	Points Scored
Questions		
Selection Criteria		
Significance		
1. Significance	25	23
Quality of Project Design		
1. Project Design	35	33
Adequacy of Resources/Quality of Management Plan		
1. Resources/Management Plan	20	20
Sub Total	80	76
Priority Questions		
Competitive Preference Priority		
Competitive Preference Priority		
1. Absolute Priority 3	5	0
Sub Total	5	0
Total	85	76

Technical Review Form

Panel #25 - EIR Early Phase Tier 1 - 24 - 1: 84.411C

Reader #3: *****

Applicant: Project SYNCERE (U411C190108)

Questions

Selection Criteria - Significance

1. The Secretary considers the significance of the proposed project. In determining the significance of the proposed project, the Secretary considers the following factors:

(1) The potential contribution of the proposed project to increased knowledge or understanding of educational problems, issues, or effective strategies.

(2) The extent to which the proposed project involves the development or demonstration of promising new strategies that build on, or are alternatives to, existing strategies.

Strengths:

1) Project SYNCERE has proposed a STEM education program called ENpowered that utilizes a project-based approach with robotics to solve engineering problems in order to interest 6th graders in STEM disciplines and engineering careers. The paradigm they have developed, using a project-based approach, informal learning in a team atmosphere, participation from STEM businesses and engineers in the community and team competition as a capping event, is outstanding. The use of team competition gives the students further encouragement to develop their skills in teamwork and problem solving, and provides them with a feedback on their progress towards competency in those areas. Past experience of Project SYNCERE with other STEM education projects in the Chicago area (page e29) has demonstrated the effectiveness of the organization and the applicability of their pedagogical model. The proposal identifies the low numbers of individuals of color and women in STEM fields, and addresses those two underrepresented groups with the proposed program. The applicant also clearly identifies the need for these STEM education activities for this student Chicago student population, with data demonstrating a large number of underrepresented populations in the participating schools and students with economic need (page e21). The results from the program should be able to be disseminated and the program replicated in other similar settings around the country. The strategies are straightforward, curricular guides and training programs for staff have been prepared, and participating businesses have a vested interest in supporting these STEM education programs to improve the workforce skills and demographics.

2) The proposed STEM education program utilizes several accepted strategies for teaching STEM disciplines to K-12 students and encouraging them to develop important work-related skills. Those include project-based learning, informal learning, mentor engagement, utilizing engineers as instructors, and using competition as a motivator for learning and building teamwork and problem solving skills (described on pagee25-e26). Data will be collected for the project so that program outcomes can be shared as other school districts consider similar STEM education programming. Project leadership has a history of sharing the results of their program outcomes with other STEM educators in publications and at national meetings (page e35). The concept of using engineers to deliver instruction, co-teach, and act as role models (mentor engagement described on page e26) is an idea firmly based in published educational research and is an especially important facet of the proposal as it solidifies the participation of businesses in the Chicago area in this important effort.

Weaknesses:

1) The only weakness in this proposal is whether it truly provides a new approach, or whether this is simply adding on to Project SYNCERE's current project-based STEM education program by adding 7 new schools and developing 4 new curricular engineering project units (described on page e29). The addition of additional schools and additional curricular units is not an innovation, as the program has already been delivering other engineering project units as a part of their

previous programming. It is obvious that the ENpower model for STEM education has been successful up until this point. In fact, the applicant states that this is an effort to expand, refine, and evaluate the ENpower curriculum, rather than pilot a new program. Otherwise, this is a very strong proposal in terms of strategies used to teach STEM concepts and interest students from disadvantaged or underrepresented backgrounds in STEM careers and more specifically engineering careers.

2) There are no identifiable weaknesses in the ENpower programs likelihood of supporting the successful development and demonstration of promising new curricular content units that build on the published strategies that they relied on to develop the program.

Reader's Score: 23

Selection Criteria - Quality of Project Design

1. The Secretary considers the quality of the design of the proposed project. In determining the quality of the design of the proposed project, the Secretary considers the following factors:

(1) The extent to which the goals, objectives, and outcomes to be achieved by the proposed project are clearly specified and measurable.

(2) The extent to which there is a conceptual framework underlying the proposed research or demonstration activities and the quality of that framework.

(3) The adequacy of procedures for ensuring feedback and continuous improvement in the operation of the proposed project.

Strengths:

1) The goals, objectives, and outcomes for the ENpower program are clearly defined in Table 1 on pages e33-34. The objectives are clearly stated and linked to each of the stated goals of the proposal. Furthermore, the objectives are consistent with the stated priorities of the EIR program. Outcomes are listed for each of the identified objectives and seem reasonable given the previous history of Project SYNCERE and the scope of this project. It was helpful that the applicant clearly identified each portion of a ten-week student program and related the pedagogical importance of each step of the program. The staffing for each aspect of the program was also clearly explained. The educational curriculum will be aligned with both Next Generation Science Standards and Common Core Standards for Math (page e30), assisting school districts and teachers with aligning the curriculum with what their goals are at their individual schools. This is a very well described and thought out project design.

2) The ENpower program has a very strong conceptual framework that uses project-based learning to drive skills development important to engineering and other STEM disciplines. The project-based learning approach encourages students to adopt the five step engineering design process approach to solve problems (ask, imagine, plan, create, and improve as described on page e30). It is especially important that the curriculum is designed to scaffold learning (page e30) so that content and skills build on one another and students are required to return to previous things they have learned to solve problems. In that way, it encourages students to utilize other STEM content they have learned, applying knowledge and developing deeper understanding. Furthermore, it is very important that the activities are team-oriented and do not motivate student to work individually. Finally, the culmination of the program with a competition (page e32) encourages students to get excited about problem solving and allows them to see other engaged students who are like them. Although, competition always results in winners and losers, mentored participation in competitive events also teaches students skills in competition, fair play, following rules, acknowledging success and failure, graciousness in victory and defeat, etc. This is a very strong conceptual framework for the project design.

3) The applicant lists several mechanisms for formative evaluation and feedback in the ENpower program to allow continuous quality improvement of the program. These mechanisms are clearly defined in Table 2 (page e35-e37) in the proposal, listing dates, activities, and responsibilities. Furthermore, performance measures for each of the program objectives are listed in the Appendix beginning on page e105. Sample participant surveys are also included in the Appendix. The applicant states that a more detailed schedule and timeline for formative evaluation and feedback for CQI

will be developed and managed in TaskRay which is part of their Salesforce CRM platform (pages e34-e35). This appears to be a strong plan for providing the data necessary for continuous quality improvement of the program while the grant is being administered.

Weaknesses:

- 1) Because the applicant has developed a program primarily directed at students participating in program activities, it is not clear whether their teachers will receive significant professional development in order to integrate the skills development their students will be receiving with their own curricular content. Furthermore it is likely that time spent on this program may detract from ability to deliver their current content. There is no discussion or acknowledgement of that likely impact of participation in the program. Otherwise, there is no other significant weaknesses in the proposed project plan. Project goals, objectives, and outcomes are clearly specified and measurable.
- 2) There is no identifiable weakness in the proposal in the design of the conceptual framework underlying the project.
- 3) There is no identifiable weakness in the proposal in the area of ensuring formative evaluation and feedback mechanisms are in place, allowing continuous quality improvement of the program to occur.

Reader's Score: 33

Selection Criteria - Adequacy of Resources/Quality of Management Plan

1. **The Secretary considers the adequacy of resources and the quality of the management plan for the proposed project. In determining the adequacy of resources and quality of the management plan for the proposed project, the Secretary considers the following factors:**

- (1) The adequacy of the management plan to achieve the objectives of the proposed project on time and within budget, including clearly defined responsibilities, timelines, and milestones for accomplishing project tasks.**
- (2) The qualifications, including relevant training and experience, of key project personnel.**
- (3) The potential for continued support of the project after Federal funding ends, including, as appropriate, the demonstrated commitment of appropriate entities to such support.**

Strengths:

- 1) A very detailed management plan with activities, a timeline and identified responsibilities is included beginning on page e35. The activities are well defined and appropriate to the mission and goals of the project. Milestones are included for many of the listed activities. The budget and budget justification are also well defined and reasonable. Project SYNCERE has a documented history of delivering successful federally-funded STEM projects as proposed within budget. They currently have an annual budget of \$1,392,000 (page e35) to provide their current STEM education programs indicating they are capable of managing large projects. The adequacy of the management plan to achieve the objectives of the proposed project on time and within budget, including clearly defined responsibilities, timelines, and milestones for accomplishing project tasks.
- 2) The key personnel are listed with their educational training and professional experiences identified. All are well qualified for the job. Executive Director Coleman (CV on pages e67-e68) has run Project SYNCERE successfully for ten years and has experience running a program this proposal is derived from. Program Director Wheeler (CV on page e69) has a similar level of experience of 9 years with STEM programming and has run similar programming for SYNCERE. Other identified program leaders, trainers and administrators are also well qualified. The identified external evaluator Dr. Jenner (pages e83-e85) has experience successfully evaluating similar STEM programs.
- 3) Project SYNCERE has been developing and supporting STEM education programs in the Chicago area for K-12 student for 9 years. They have a documented history of being able to raise funding from companies and philanthropic organization to support programming even if original funding was provided by federal grant support. Furthermore, the

program utilizes volunteer support from companies in the region to provide some of the instruction and mentoring for activities. Since these companies (Lenovo, Boeing, Exelon) have invested in the program when federal grant funding was active, there is a greater likelihood they will continue to volunteer and contribute to the effort. It is also important that the curricular materials will survive for reuse after the funding has ended also.

Weaknesses:

- 1) The adequacy of the management plan is very detailed, well defined and appropriate. There are no weaknesses in the project proposal in the area of the management plan, management timeline, staffing or budgeting.
- 2) There are no weaknesses in the qualifications of the key personnel in terms of their qualifications, experience and relevant training.
- 3) The Project SYNCERE group has been running similar STEM education programming for many years. They have previously been successful in fundraising to continue programming after grant support terminates. The likelihood of this STEM project-based learning program continuing with support from businesses in the community after federal funding ends is very high. There are no weaknesses in this area of the proposal.

Reader's Score: 20

Priority Questions

Competitive Preference Priority - Competitive Preference Priority

1. **Within Absolute Priority 3, we give competitive preference to applications that address the following priority:**

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Note: Projects addressing this priority must be administered in a manner consistent with nondiscrimination requirements contained in the U.S. Constitution and Federal civil rights laws.

Strengths:

Not applicable.

Weaknesses:

Not applicable.

Reader's Score: 0

Status: Submitted

Last Updated: 06/13/2019 08:55 PM

