Budget

Ohio University (063024) - Athens County - 2017 - Straight A Fund - Rev 0 - Straight A Fund - Application Number (134)

U.S.A.S. Fund #: 466

Plus/Minus Sheet (opens new window)

Object Code / Purpose Code	Salaries 100	Retirement Fringe Benefits 200	Purchased Services 400	Supplies 500	Capital Outlay 600	Other 800	Total
Instruction	105,778.15	30,454.29	0.00	0.00	0.00	0.00	136,232.44
Support Services	124,000.00	916.36	0.00	0.00	0.00	0.00	124,916.36
Governance/Admin	21,740.69	6,006.00	0.00	0.00	0.00	0.00	27,746.69
Prof Development	0.00	0.00	125,000.00	0.00	0.00	0.00	125,000.00
Family/Community	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Safety	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Facilities	0.00	0.00	0.00	50,000.00	535,000.00	0.00	585,000.00
Transportation	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Indirect Cost						0.00	0.00
Total	251,518.84	37,376.65	125,000.00	50,000.00	535,000.00	0.00	998,895.49
						Adjusted Allocation	0.00
						Remaining	-998,895.49

Application

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Please respond to the prompts or questions in the areas listed below in a narrative form.

A) APPLICANT INFORMATION - General Information

1. Project Title:
Multi-disciplinary Additive Manufacturing STEAM Museum of Innovation: Regional Pilot Project

2. Project Tweet: Please limit your responses to 140 characters.
Industry-connected, hands-on K-16 experiential learning in additive manufacturing (3D printing): get your cutting-edge jobs skills here!

This is an ultra-concise introduction to the project.

3. Estimate of total students at each grade level to be directly impacted each year.

*This is the number of students that will receive services or other benefits as a **direct result** of implementing this project. This does not include students that may be impacted if the project is replicated or scaled up in the future. It excludes students who have merely a tangential or indirect benefit (such as students having use of improved facilities, equipment etc. for other uses than those intended as a part of the project). The Grant Year is the year in which funds are received from the Ohio Department of Education. Years 1 through 5 are the sustainability years during which the project must be fiscally and programmatically sustained.*

Grant Year

75 Pre-K Special Education	75 K	75 1	75 2	75 3
75 4	75 5	75 6	75 7	75 8
75 9	75 10	75 11	75 12	

Year 1

80 Pre-K Special Education	80 K	80 1	80 2	80 3
80 4	80 5	80 6	80 7	80 8
8 9	80 10	80 11	80 12	

Year 2

85 Pre-K Special Education	85 K	85 1	85 2	85 3
85 4	85 5	85 6	85 7	85 8
85 9	85 10	85 11	85 12	

Year 3

90 Pre-K Special Education	90 K	90 1	90 2	90 3
90 4	90 5	90 6	90 7	90 8
90 9	90 10	90 11	90 12	

Year 4

95 Pre-K Special Education	95 K	95 1	95 2	95 3
95 4	95 5	95 6	95 7	95 8
95 9	95 10	95 11	95 12	

Year 5

100 Pre-K Special Education	100 K	100 1	100 2	100 3
100 4	100 5	100 6	100 7	100 8

100 9	100 10	100 11	100 12

4. Explanation of any additional students to be impacted throughout the life of the project.
This includes any students impacted indirectly and estimates of students who might be impacted through replication or an increase in the scope of the original project.

A partnership with key manufacturing companies and industrial trade associations such as "America Makes" will ensure program expansion state-wide if duplicated. A successful pilot will enable promotion of additive manufacturing as a curricular element in K-16 education. It is anticipated that the dissemination and analysis of pilot results to other school districts, as well as word-of-mouth from the >15 initial school visitations, will result in the engagement of additional students. List of Schools and organizations (indirect impact) Alexander Elementary American Mid-West Center for Global Cultural & Educational Exchange Amesville Elementary Coolville Elementary Eastern Local Schools Federal Hocking High School Hocking College Meigs Elementary Meigs Middle School Nelsonville Head Start Philanthropic Educational Organization Tri-County Mental Health & Counseling REACH program Union Furnace Elementary Vinton County Middle School

5. Lead applicant primary contact: - Provide the following information:

First and last name of contact for lead applicant
Jesus Pagan

Organizational name of lead applicant
Ohio University

Address of lead applicant
123C Stocker Center

Phone Number of lead applicant
740-593-1451

Email Address of lead applicant
paganj@ohio.edu

Community School Applicants: After your application has been submitted and is in Authorized Representative Approved status an email will be sent to your sponsoring entity automatically informing the sponsor of your application.

6. Are you submitting your application as a consortium? - Select one checkbox below

☐ Yes

☑ No

If you are applying as consortium, please list all consortium members by name on the "Consortium Member" page by clicking on the link below. If an educational service center is applying as the lead applicant for a consortium, the first consortium member entered must be a client district of the educational service center.

Add Consortium Members

7. Are you partnering with anyone to plan, implement, or evaluate your project? - Select one checkbox below

☑ Yes

☐ No

If you are partnering with anyone, please list all partners (vendors, service providers, sponsors, management companies, schools, districts, ESCs, IHEs) by name on the "Partnering Member" page by clicking on the link below.

Add Partnering Members

B) PROJECT DESCRIPTION - Overall description of project and alignment with goals

8. Describe the innovative project: - Provide the following information

The response should provide a clear and concise description of the project and its major components. The following questions will address specific outcomes and measures of success.

a. The current state or problem to be solved; and

Rural Appalachian youth are among America's most critically underserved populace living in dispersed, rural communities heavily impacted by a history of resource extraction, environmental degradation, diminishing jobs, and increasing health risks. Attempts to improve skillset development, such as private schooling, magnet schools or summer camps, are often beyond the reach of these least-served individuals. Proposed is a pilot project offering professionally-guided training in 'additive manufacturing:' 3D printing processes in plastics and metals. In Year One, the pilot will engage approximately 3,000 K-16 students and community visitors to a centrally-located, refurbished lab equipped with state-of-the-art 3D printing devices. This foundational STEAM program is an addition to currently-programmed school field visits to the proposed site. The lab will also be available for college class tours and community groups of all backgrounds, ages and levels of experience.

b. The proposed innovation and how it relates to solving the problem or improving on the current state.

Ohio University proposes a "Multi-disciplinary Additive Manufacturing STEAM Museum of Innovation: Regional Pilot Project". This collaborative project offers enhanced K-16 educational opportunities in partnership with the Kennedy Museum of Art, the National Additive Manufacturing Innovation (America Makes), Parker Hannifin, RP+M, the Region 14 workforce development board (WIA), the Athens City School District with outreach to other local school districts. The pilot project collaborates with America Makes to develop curricular opportunities and best practices for the use of additive manufacturing with emphasis on K-16 audiences, but open to lifelong learners of any age. The Kennedy Museum is a key asset for the community and region. Programs offered by the museum mesh well with the use of additive manufacturing as a means of educational exploration. Innovative approaches will blend the arts with innovation, science and technology to foster a STEAM educational ecosystem that disseminates technology and training to the community and the region. The museum currently serves the community with educational programs that attract more than 3500 students a year through educational outreach alone, reaching in excess of 20 educational institutions in the region. Notably, the Friends of the Kennedy donor program provides free bus transportation for half-day programming for economically-disadvantaged, rural underserved communities. Seven of the US's most distressed counties are within bussing distance of the Museum (Adams, Athens, Meigs, Morgan, Pike, Scioto, and Vinton). STEAM modules will translate competencies into traditional manufacturing and engineering skills. There will be hands-on opportunities to not only use the 3D printing machines, but also training in maintaining and constructing the components used in additive manufacturing. Modules will be disseminated via an open source learning management tool. Skills used in additive manufacturing are increasingly applied in other disciplines, hence we propose a transdisciplinary curricular approach that embraces innovation and collaboration. We are working with the local WIA board to pilot a program to leverage learning modules for workforce development, ensuring a continuity and transferability of educational credentials into the workplace. By partnering with America Makes, Parker Hannifin and RP+M, we will incorporate industry standards into the curriculum via key components used in additive manufacturing. Parker equipment is used to control many industrial machines and their Parker Automation Manager software uses an open source PLC language that can be easily coupled with other industrial components to build the foundation for active learning on 3D printers using a broad range of materials including plastics, metals and powder based solutions. Regarding hardware acquisition, the program will: (a) purchase 30 economical, off-the-shelf 3D printers for immediate use in designing and printing take-home samples for hands-on learning in 3D printing; and (b) provide experience in the engineering design, construction, programming and implementation process by visiting the site-based construction of a new and novel 3D printer. Instruction at the construction lab will include use of novel materials deposition technology (current 3D printers overwhelmingly use plastics for 3D extrusion, to which our program adds powder-based, and metal 3D printing). Program primary goals are establishing shared technology training resources and developing curriculum that integrates additive manufacturing training programs with STEAM outreach. To support sustainable platforms for innovation and student training, teacher training opportunities will be offered such as software and hardware seminars. This will enable teachers in underserved schools to build their own machines using local expertise and resources. Empowering teachers encourages a new generation of makers and collaborators.

9. Select which (up to four) of the goals your project will address. For each of the selected goals please provide the requested information to demonstrate your innovative process. - (Check all that apply)

☑ a. Student achievement

i. List the desired outcomes.
Examples: fewer students retained at 3rd grade, increase in graduation rate, increased proficiency rate in a content area, etc.

Desired outcomes of the project are: * Increase student knowledge of additive manufacturing technologies through the use of software and hardware for designing, scanning and printing objects that support multi-disciplinary learning. * Create additive manufacturing modules for education that can be implemented in the classroom or use at home. * Establish share resources for additive manufacturing at the Museum to support regional education and increase access among rural underserved populations. * Enhance access to Science, Technology, Engineering, Arts and Mathematics through regional inter-school collaboration by the use of 3D printing for a major collaborative project. * Enhance individual student's employability skills through hands-on immediately accessible skill set using additive manufacturing. This will lead to a path of lifelong learning.

ii. What assumptions must be true for this outcome to be realized?
Examples: early diagnosis and intervention are needed to support all children learning to read on grade level; project-based learning results in higher levels of student engagement and learning, etc.

*By learning some basic tools, such as CAD software at an early age, students can develop skill that translate in the ability to transform and create many objects that can be used for many aspects of their daily life as well as in many disciplines. * The skills teachable through additive manufacturing tools and processes are an integral component of modern-day innovation, including prototyping, rapid idea iteration, design for manufacture and eventual production. * Exposure to these tools and methodologies will enhance interest in further exploration of these concepts (some available locally; e.g. through Pike County's Shawnee State University's digital process courses) and as a near and longer-term competitive edge for young workers entering the job market. *Interschool collaborative work will enhance learning, dovetail with standards, and intersect well with existing curricular priorities. * Employability is enhancedthrough additive manufacturing skills.

iii. Describe any early efforts you have made to test these assumptions (pilot implementation, etc), or how these are well-supported by the literature.

Market growth for additive manufacturing skills and experience is growing exponentially. Research in early 2015 indicated that "in one month, 35 percent of engineering job listings from fields including biomedical, software, and transportation industries required applicants familiar with 3-D printing and additive manufacturing processes." The same report found that companies are having a difficult time finding candidates with adequate skills (http://theinstitute.ieee.org/career-and-education/career-guidance/thirtyfive-percent-of-engineering-jobs-now-require-3d-printing-skills Institute of Electrical and Electronics Engineers). Similarly, the 2014 Wohlers Report cites global 3D printing industry growth from its current low-single-digit figure to $21B in 2020. Without doubt 3D printing (additive manufacturing) is a global and growing in-demand skillset. Further, access to basic 3D printing information and tutorials are readily available online. Ohio University's Engineering Technology and Management Department in the Russ College of Engineering and Technology currently operate four MakerBot 3D printers. The Department has seen an increase in use and collaboration across disciplines, struggling to meet demand for use and training. A similar demand is seen in other units with 3D printers. Our college offers the Rapid Product Development Lab space to execute class projects. This lab is run by several paid student workers who work with their peers to provide print services and engineering design

tutoring with input towards design optimization. Students serve as subject matter experts while completing print jobs serving lab objectives. The Russ College adheres to the principle that students should understand and apply technology, and the college works to meet demand at all levels (e.g. entrepreneurship students explore the use of 3D printers for product development in competitions such as Start-Up Weekend; senior engineering students use the 3D printers for early design and prototype development, and graduate students use it for research activities. Current capacity limits opportunities to partner across disciplines to use 3D printing technology for novel applications, although preliminary projects suggest that there are rich opportunities for innovation: so far, we have leveraged technology to help students to design and develop drones, to realize the geometric optimization of novel bridge structures, and to produce physical objects for use in virtual reality applications. Notably, an increasing number of students pursue design as a personal creative endeavor. We are frequently contacted by students with a design that they have created and would like to realize; this is exactly the type of interaction we want to promote. A STEAM manufacturing summer camp pilot program conducted last year indicated regional acceptance of after-school programming promoting learning beyond the classroom. The program explored the manufacture of automatic doors using Arduinos to control the door's latching mechanism. The program was well-attended with some young kids traveling as far as 40 miles to attend the camp. The proposed program will fill a widening gulf between the needs of students and currently available resources. Example projects developed purely through word of mouth within the university. We endeavor to not turn work away, but we also do not advertise the capabilities we have simply because we do not have bandwidth on the existing equipment. Sponsorship of this proposal will not only significantly increase the bandwidth of our existing labs, but it will allow us to make this capability available outside of the university. We have completed numerous tours and continue to showcase the limited additive manufacturing capabilities currently in place. By creating this center, we will be able to expand our capabilities and increase the outreach and collaboration with many of our educational partners and the community.

iv. List the specific indicators that you will use to measure progress toward your desired outcome.
These should be measurable changes, not merely the accomplishment of tasks. Example: Teachers will each implement one new project using new collaborative instructional skills, (indicates a change in the classroom) NOT; teachers will be trained in collaborative instruction (which may or may not result in change).

Post-visit assessment will include surveys of visiting classes immediately after the visit and again 6 months later. Questions will include: * Implementation of active learning projects in the laboratory setting, divided into K-12, 13-16, teachers, and elders and other community groups. * Level of interest in and engagement in the presentations and hands-on opportunities, followed at 6 months by memory of the information and continued use or interest on the part of students. * Level of interest in and engagement with the curricular materials at home schools by visiting teachers, and degree of continuing interest and engagement at the 6-month mark. * General statistical assessment of the trends in additive manufacturing job opportunities, regionally and in adjoining States, for inclusion in the project final report.

v. List and describe pertinent data points that you will use to measure student achievement, providing baseline data to be used for future comparison.

Data points for assessment of program impact will include: * Degree of information retention and continued exploration and interest on the part of K-12 school districts at the 6-month survey period. * Degree of continued interest and engagement with the topic materials by the school teachers and administrators at the 6-month mark. * Degree of CAD utilization and collaboration through our on-line application. (Measure the number of CAD users) * Degree of utilization of 3D printing services. Measure the number of 3D print jobs requested by school district and/or individuals.

vi. How are you prepared to alter the course of your project if assumptions prove false or outcomes are not realized?

Anticipated modifications to the program could include: * Improved or enhanced logistics, in the event that school funding cutbacks limits the number of field trips possible during the pilot period. * Modification of the curricular materials on the basis of student and teacher engagement and continuing interest. * Increased affiliation with both local and State industry and with local institutions of higher education to directly link programming with improved academic and job track opportunities, particularly for K-12 participants. * Increase the number of visitation to the schools and promotional material. (The main delivery method assumes users have online access for CAD utilization through a browser.)

☐ b. Spending reductions in the 5 year forecast

i. List the desired outcomes.
Examples: lowered facility cost as a result of transition to more efficient systems of heating and lighting, etc.; or cost savings due to transition from textbook to digital resources for teaching.

ii. What assumptions must be true for this outcome to be realized?
Example: transition to "green energy" solutions produce financial efficiencies, etc.; or available digital resources are equivalent to or better than previously purchased textbooks.

iii. Describe any early efforts you have made to test these assumptions (pilot implementation, etc), or how these are well-supported by the literature.

iv. Please enter the Net Cost Savings from your FIT.

v. List and describe the budget line items where spending reductions will occur.

vi. How are you prepared to alter the course of your project if assumptions prove false or outcomes are not realized?

☐ c. Utilization of a greater share of resources in the classroom

i. List the desired outcomes.
Example: change the ratio of leadership time spent in response to discipline issues to the time available for curricular leadership.

ii. What assumptions must be true for this outcome to be realized?
Examples: improvements to school and classroom climate will result in fewer disciplinary instances allowing leadership to devote more time to curricular oversight.

iii. Describe any early efforts you have made to test these assumptions (pilot implementation, etc), or how these are well-supported by the literature.

iv. Please provide the most recent instructional spending percentage (from the annual Ohio School Report Card) and discuss any impact you anticipate as a result of this project.
Note: this is the preferred indictor for this goal.

v. List any additional indicators that you will use to monitor progress toward your desired outcome. Provide baseline data if available.
These should be specific outcomes, not just the accomplishment of tasks. Example: fewer instances of playground fighting.

vi. How are you prepared to alter the course of your project if assumptions prove false or outcomes are not realized?

☑ d. Implementing a shared services delivery model

i. List the desired outcomes.
Examples: increase in quality and quantity of employment applications to districts; greater efficiency in delivery of transportation services, etc.

A shared equipment implementation will allow greater utilization of the resources and distribution of the educational material through existing learning management systems. For example: * Two new, and one existing, Appalachian Ohio maker-spaces are in discussions regarding shared use of purchased equipment, trainers and curricular materials for this pilot program: the ReUse Athens County Makerspace, the nascent Somerset County Makerspace, and the Zane State University Makerspace. * The State of Ohio has funded a strong and growing entrepreneurial ecosystem that supports new venture startup, particularly in technology and technology-enabled fields. Use of the pilot labs by local innovators, local incubators and commercialization programs (such as Ohio University Innovation Center, Muskingham Business Incubator, TechGROWTH Ohio program, and Ohio University's College of Business commercialization programs) will enhance regional capacity for new concept ideation and prototyping.

ii. What assumptions must be true for this outcome to be realized?
Example: neighboring districts have overlapping needs in administrative areas that can be combined to create efficiencies.

* Time and effort must be spent on maintaining shared service arrangements with the proposed partners. * The local makerspace movement must continue to evolve and establish itself. * Incubators and commercialization programs must be flexible and open to new technological enablers and new curricula. * Our group must stay current in advances in technology to support new ideas and upgrades to additive manufacturing equipment as well as the curriculum.

iii. Describe any early efforts you have made to test these assumptions (pilot implementation, data analysis etc), or how these are well-supported by the literature.

Pilot program creators are strongly collaborative with a wide range of University units and regional innovator and entrepreneurial support providers. The concept of an additive manufacturing equipment and implementation programming has been well-received by the entrepreneurial ecosystem. Care is being taken to avoid overlap between equipment purchases and curricula development, so as to best allocate scarce resources. Specific connections and collaborations include: * Collaboration with Hocking College through leverage of their 3D printer and CAD program. * Acquisition of Innovation Center's 3D printer as a University shared resource. * Ongoing discussions with regional Makerspace innovators and potential target markets for the on-site and off-site programming among both K-12 and other potential recipients.

iv. List the specific indicators that you will use to monitor progress toward your desired outcomes.
These should be measureable changes, not the accomplishment of tasks.
Example: consolidation of transportation services between two districts.

Indicators - central location for 3D printing and dissemination of information as it relates to additive manufacturing. * Number of collaborative tours and curricular offerings between University and regional collaborators during the pilot program. * Continued sharing of program iterations and developments, including more that are jointly-produced. (Listening to the needs of the teachers and students in order to deliver quality modular exercises and curriculum that meet school standards.)

v. List and describe pertinent data points that you will use to evaluate the success of your efforts, providing baseline data to be used for future comparison.
Example: change in the number of school buses or miles travelled.

* Number of modules developed and tracking of the modules used by regional educational organizations * Number of overall visitors to the Museum. * Number of economically-underserved school groups served by the Museum. * Number of outreach activities requested. * Number of outreach activities delivered. * Number of return visits by economically-underserved students/families to the Museum. * Number

of CAD users * Number of 3D print jobs

vi. How are you prepared to alter the course of your project if assumptions prove false or outcomes are not realized?

The key to a shared services model is continuing communication and collaborative program design, implementation, evaluation and modification. If collaboration with the partners involved, and an increase in the numbers of partners does not occur, then corrective measures must be taken on these four elements of the pilot. The pilot creators are open to the concept that this pilot could be subsumed into programming through one of the collaborators, could be shared more broadly, or might need substantial modification if any of the major collaborators found the content less compelling for their clientele than assumed.

10. Which of the following best describes the proposed project? - (Select one)

- [ ] a. New - Never before implemented
- [ ] b. Existing - Never implemented in your community school or school district but proven successful in other educational environments
- [ ] c. Replication - Expansion or new implementation of a previous Straight A Project
- [x] d. Mixed Concept - Incorporates new and existing elements
- [ ] e. Established - Elevating or expanding an effective program that is already implemented in your district, school or consortia partnership

C) BUDGET AND SUSTAINABILITY

11. Financial Information: - All applicants must enter or upload the following supporting information. The information in these documents must correspond to your responses in questions 12-19.

a. Enter a project budget in CCIP (by clicking the link below)

Enter Budget

b. If applicable, upload the Consortium Budget Worksheet (by clicking the Upload Documents link below)

c. Upload the Financial Impact Table (by clicking the Upload Documents link below)

Upload Documents

The project budget is entered directly in CCIP. For consortia, this project budget must reflect the information provided by the applicant in the Consortium Budget Worksheet. Directions for the Financial Impact Table are located on the first tab of the workbook. Applicants must submit one Financial Impact Table with each application. For consortium applications, please add additional sheets instead of submitting separate Financial Impact Tables.

998,895.49 12. What is the amount of this grant request?

13. Provide a brief narrative explanation of the overall budget.
Responses should provide a rationale and evidence for each of the budget items and associated costs outlined in the project budget. In no case should the total projected expenses in the budget narrative exceed the total project costs in the budget grid.

(100 Salaries) Support for 8 faculty members collaborating in the grant to manage, develop, implement and teach the course materials. Support for 4 graduate and 8 advanced undergraduate students to work on the development of the lab, installation of equipment and support managing the day to day operation. (200 Fringe Benefits) Fringe benefits are calculated at 16.189% for faculty and staff. This includes retirement (14%), Medicare (1.45%) and workers compensation (.739%). Graduate and undergraduate student benefit rate is calculated at .739% for workers compensation. Health insurance is currently an additional $12,432 and increased by 5% each year, but is only charged during the academic year for faculty and staff and prorated to the percent of effort. (400 Purchased Services) Funds will help pay for teacher training programming and support for implementing the associated outreach programs at the museum. (500 Supplies) Funds will be spent to support CAD design software, hardware and furnishings in order to enhance the current offerings (CAD Lab). (600 Capital Outlay) Funds will be allocated for the acquisition of start-up 3D printing equipment from MakerBot which includes materials, support and printing management software as well as other supplemental equipment (scanners, finishing and processing components) from other companies as capacity building for 3D printing activities such as training and support for courses that will allow the project to start operating immediately after installation of equipment. Additional funds will be utilized for additional additive manufacturing components as the center piece of the educational modules in order to develop and showcase how additive manufacturing works. These components will be used as teaching aids and instructional 3D printers showcasing various material processing technologies in additive manufacturing. Also some funds will be used for the renovation of spaces at the Museum for the 3D printers and the CAD Lab.

14. Please provide an estimate of the total costs associated with maintaining this program through each of the five years following the initial grant implementation year (sustainability costs). This is the sum of expenditures from Section A of the Financial Impact Table.

55,546.29 a. Sustainability Year 1

64,428.05 b. Sustainability Year 2

64,428.05 c. Sustainability Year 3

64,428.05 d. Sustainability Year 4

64,428.05 e. Sustainability Year 5

15. Please provide a narrative explanation of sustainability costs.
Sustainability costs include any ongoing spending related to the grant project after June 30, 2017. Examples of sustainability costs include annual professional development, staffing costs, equipment maintenance, and software license agreements. To every extent possible, rationale for the specific amounts given should be outlined. The costs outlined in this narrative section should be consistent and verified by the financial documentation submitted and explained in the Financial Impact Table. If the project does not have sustainability costs, applicants should explain why.

The majority of expenses are one-time costs related to the project facilities and equipment setup including expenses to renovate the museum space to fit the proposed pilot project. Sustainability of faculty and staff involvement will be addressed by including this project, as appropriate, in federal and foundation grants. Participants have a strong funding history, and a track record for sustaining long-term projects over a decade or more. Faculty, staff, undergraduate and graduate students will be available to work with the Museum through service learning outreach activities supporting existing programs within the University that will benefit from access to a shared equipment facility like the proposed one. Funds needed to sustain student personnel roles in the project will be addressed by leveraging existing mechanisms for student employment at Ohio University (e.g., Program to Aid Career Exploration [PACE], Honors Tutorial College [HTC], Voinovich Scholars Program, Federal Work-Study Program as well as fellowships, grants and other forms of graduate support from Ohio University).

0 16. What percentage of these costs will be met through cost savings achieved through implementation of the program?

Total cost savings from section B of the Financial Impact Table divided by total sustainability cost from section A of the Financial Impact Table. If the calculated amount is greater than 100, enter 100 here.

17. Please explain how these cost savings will be derived from the program.
Applicants who selected spending reductions in the five-year forecast as a goal must identify those expected savings in questions 16 and 17. All spending reductions must be verifiable, permanent, and credible. Explanation of savings must be specific as to staff counts; salary/benefits; equipment costs, etc.

100 18. What percentage of sustainability costs will be met through reallocation of savings from elsewhere in the general budget?

Total reallocation from section C of the Financial Impact Table divided by total sustainability cost from section A of the Financial Impact Table
Note: the responses to questions 16 and 18 must total 100%

19. Please explain the source of these reallocated funds.
Reallocation of funds implies that a reduction has been made elsewhere in the budget. Straight A encourages projects to determine up front what can be replaced in order to ensure the life of the innovative project.

D) IMPLEMENTATION

20. Please provide a brief description of the team or individuals responsible for the implementation of this project, including other consortium members or partners.

This response should include a list of qualifications for the applicant and others associated with the grant. Please list key personnel only. If the application is for a consortium or a partnership, the lead should provide information on its ability to manage the grant in an effective and efficient manner. Include the partner/consortium members' qualifications, skills and experience with innovative project implementation and projects of similar scope.

Enter Implementation Team Key Personnel information by clicking the link below:

Add Implementation Team

For Questions 21-23 please describe each phase of your project including its timeline, and scope of work.

A complete response to these questions will demonstrate awareness of the context in which the project will be implemented and the time it will take to implement the project with fidelity. A strong plan for implementing, communicating and coordinating the project should be apparent, including coordination and communication in and amongst members of the consortium or partnership (if applicable). Not every specific action step need be included, but the outline of the major steps should demonstrate a thoughtful plan for achieving the goals of the project. The timeline should reflect significant and important milestones in an appropriate time frame.

21. Planning

a. Date RangeAugust 8, 2016 - June 30, 2017

b. Scope of activities - include all specific completion benchmarks.

Planning: Fall Semester 2016 Planning of activities and kick-off meeting Recruitment and commitment of graduate and undergraduate student personnel Setting up database and questionnaires for project evaluation Purchase of 3D printer equipment, scanners and printer racks Purchase of computers, software and lab furniture for CAD lab Begin development of initial modules for additive manufacturing Plan and advertise the first teacher training session Plan and advertise community training session Begin purchasing 3D printer components for construction of machine (hardware, software and delivery system. Spring Semester 2017 Continue to promote and expand the teacher training activities Host a multi-disciplinary event to promote collaboration across university departments Summer Semester 2017 Prepare for continuation plans for second year activities based on results of the first year implementation

22. Implementation(grant funded start-up activities)

a. Date RangeAugust 8, 2016 - June 30, 2017

b. Scope of activities - include all specific completion benchmarks

Implementation: Fall Semester 2016 Team assignments based on availability of equipment and personnel Implementation of CAD lab including set-up and installation of equipment approximately 30 days after purchase order Implementation of learning management system Start promoting the shared facilities (through an Open House for schools) Start promoting the shared facilities (through an Open House for the community) Gather results for first semester activities Museum space retrofit/upgrades Begin purchasing 3D printer components for construction of machine (hardware, software and delivery system. Spring Semester 2017 Gather results for second semester activities Summer Semester 2017 Gather results for end of the fiscal year activities Create report and consolidate all data from the pilot project year.

23. Programmatic Sustainability (years following implementation, including institutionalization of program, evaluation and communication of program outcomes)

a. Date RangeJuly 1, 2017 - June 30, 2022

b. Scope of activities - include all specific completion benchmarks

Initial and repeat visitors to the additive manufacturing lab at the Kennedy Museum will gain knowledge of, exposure to, and eventually develop skills in a rapidly-evolving high-tech field. With program teachers and mentors available to participants, it is expected that many will find encouragement, even at a very early age, to enter into the growing SE Ohio entrepreneurial ecosystem. Program attendees will be well-placed to compete in new and existing middle school and high school venture pitch competitions (which require verbal and slide deck presentation of an overview of a new venture concept to a panel of judges, al la 'Shark Tank' for junior entrepreneurs). Ohio has a very strong entrepreneurial ecosystem, many institutional participants of which are located in SE Ohio and willing and eager to engage with younger entrepreneurs.

E) SUBSTANTIAL IMPACT AND LASTING VALUE

24. Describe the expected changes to the instructional and/or organizational practices in your institution.

The response should illustrate the critical instructional and/or organizational changes that will result from implementation of the grant and the impact of these changes. These changes can include permanent changes to current district processes, new processes that will be incorporated or the removal of redundant processes. The response may also outline the expected change in behaviors of individuals (changes to classroom practice, collaboration across district boundaries, changes to a typical work day for specific staff members, etc.). The expected changes should be realistic and significant in moving the institution forward.

Please enter your response below:

The pilot implementation team envisions immediate and substantial impact on regional Appalachian K-16 youth, as well as lasting impact on the SE Ohio regional entrepreneurial and economic development landscape. * School districts and partners listed in Question 1 encompassing >3,000 visitors to the Kennedy Museum annually, will derive immediate and substantial impact in the form of: For students: -Awareness of the existence and importance of additive manufacturing in the current academic, entrepreneurial, production and professional spheres. -Personal, hands-on experience using additive manufacturing equipment, digital manipulation and 3-D building techniques. -For teachers/administrators: -Curricular materials for distribution and replication in respective educational environments. -Ongoing support and contact for questions, on-site visits, and follow-up, including regional tours of equipment and training * The community at large, including a diversity of museum visitors, will have equal opportunity to experience presentation and hands-on experimentation in interactive labs staffed by expert professional trainers. * Regional collaborators will enjoy enhanced capacity with synergistic uses for equipment and training; e.g. -Shared digital imaging and 3-D printing services/programming between our pilot, Russ College of engineering, Shawnee State University, and regional incubators such as Ohio University Innovation Center, MCBI in Zanesville and Zane State's makerspace program. -Equipment and training will enable regional technology and tech-based innovators to locally source imaging, ideation and prototyping. * Part of sustainability plan preparation will include use of existing graduate student researchers at TechGROWTH Ohio, assessing validity of pilot in collaboration with internal assessment team and engaging in a literature review of all programming in preparation for potential expansion/replication.

25. Please provide the name and contact information for the person and/or organization who will oversee the evaluation of this project.

Projects may be evaluated either internally or externally. However, evaluation must be ongoing throughout the entire period of sustainability and have the capacity to provide the Ohio Department of Education with clear metrics related to each selected goal.

Please enter your response below:

Ohio University's Voinovich School of Leadership and Public Affairs, with over four decades' experience in educational program research, implementation, and evaluation, including evaluations of several prior Straight A grant programs, is a committed collaborator willing to evaluate the pilot program as described. Contact information is: Dr. Marsha Lewis Voinovich School of Leadership and Public Affairs 19 Circle Drive, The Ridges, Ohio University Athens OH 45701 Email: lewism5@ohio.edu Phone: (740)593-1435 [desk]

26. Describe the overall plan for evaluation, including plans for data collection, underlying research rationale, measurement timelines and methods of analysis.

This plan should include the methodology for measuring all of the project outcomes. Applicants should make sure to outline quantitative approaches to assess progress and measure the overall impact of the project proposal. The response should provide a clear outline of the methods, process, timelines and data requirements for the final analysis of the project's progress, success or shortfall. The applicant should provide information on how the lessons learned from the project can and will be shared with other education providers in Ohio. Note: A complete and comprehensive version of

the evaluation plan must be submitted to ODE by all selected projects.

Ohio University's Voinovich School of Leadership and Public Affairs will serve as the external evaluator for the project. The comprehensive evaluation will capture both process and outcome data in order to provide information for future scale-up or replication. The process evaluation questions include: -Do teachers in the participating school districts implement the additive manufacturing modules developed through the project? -Do teachers remain engaged with the project after initial introduction? -Do teachers use the CAD software provided during training? -Do students use the CAD software? -Do student engage other students after participation in the Museum activities? -Do teachers pass on the information to other teachers within their schools or districts? Process evaluation methodologies include teacher interviews, observations of workshops, post-visit surveys, follow-up surveys, and artifact/document reviews of new curriculum. Post-visit assessment will include surveys of visiting classes immediately after the visit and again 6 months later. Questions will focus on level of interest in and engagement in the presentations and hands-on opportunities, followed at 6 months by memory of the information and continued use or interest on the part of students and the teachers. The outcome evaluation questions include: -Do participating students gain knowledge of additive manufacturing technologies? -Do participating students develop skills in utilizing tools such as CAD software? -Do participating students increase their awareness of career opportunities in the high-tech manufacturing sector? -Do participating students show an increased interest in high-tech manufacturing or related careers as a result of participating in the project activities? The outcome evaluation will utilize: -Pre- and post-tests measuring students' knowledge of additive manufacturing technologies and careers in high-tech manufacturing. -Pre- and post- student career interest inventories.

27. Please describe the likelihood that this project, if successful, can be scaled-up, expanded and/or replicated. Include a description of potential replications both within the district or collaborative group, as well as an estimation of the probability that this solution will prove useful to others. Discuss the possibility of publications, etc., to make others aware of what has been learned in this project.

The response should provide an explanation of the time and effort it would take to implement the project in another district, as well as any plans to share lessons learned with other districts. To every extent possible, applicants should outline how this project can become part of a model so that other districts across the state can take advantage of the learnings from this proposed innovative project. If there is a plan to increase the scale and scope of the project within the district or consortium, it should be noted here.

Pending successful implementation of the sort envisioned by the project team, there are high hopes for scalability, expansion and replicability. Within rural SE Ohio, it is assumed that the nexus of this program will remain with the few institutions training in, or closely affiliated with, digital imaging and 3-D printing programs; e.g. Ohio University, Shawnee State University, Zane State University, Washington State College and Hocking College. It is expected that incorporating the program into existing rural youth outreach during the school year, similar to this plan proposed with the Kennedy Museum, will have the most impactful reach. Modifying the program to incorporate a 'touring show' aspect, with some equipment and mobile demonstrations, will enhance regional capacity to accept the program. Planning for expansion and replication also requires in-depth study of other such programming, even if in better-served or urban environments. Some online research has been achieved in preparation for this proposal and for example Xavier University in Cincinnati "signed an agreement with MakerBot, a global leader in the desktop 3D printing industry, to bring a MakerBot Innovation Center to campus" http://www.xavier.edu/news/First-MakerBot-3D-Printing-Innovation-Center-in-the-Midwest-opens-at-Xavier.cfm#.VyuksKQrKSQ. An aspect of the sustainability plan is use of existing graduate student labor to further research and cross-check lessons-learned from other programs using similar outreach and additive manufacturing messaging and curricula. Detailed planning for expansion and replication will depend on evaluative data gathered from the pilot: e.g. whether students, teachers and/or community members gained and retained the anticipated information, whether additional partnerships with industry and the local entrepreneurial ecosystem were achieved, whether curricular materials were used and appreciated. Our approach to curricular material dissemination will have

By virtue of applying for the Straight A Fund, all applicants agree to participate in the overall evaluation of the Straight A Fund for the duration of the evaluation time frame. The Governing Board of the Straight A Fund reserves the right to conduct an evaluation of the project and request additional information in the form of data, surveys, interviews, focus groups and other related data on behalf of the General Assembly, Governor and other interested parties for an overall evaluation of the Straight A Fund.

PROGRAM ASSURANCES: I agree, on behalf of this applicant, and any or all identified consortium members or partners, that all supporting documents contain information approved by a relevant executive board or its equivalent and to abide by all assurances outlined in the Straight A Assurances (available in the document library section of the CCIP).

Yes, I agree.

Consortium

Ohio University (063024) - Athens County - 2017 - Straight A Fund - Rev 0 - Straight A Fund

Sections

Consortium Contacts

No consortium contacts added yet. Please add a new consortium contact using the form below.

Partnerships

Ohio University (063024) - Athens County - 2017 - Straight A Fund - Rev 0 - Straight A Fund

Sections

Partnerships							
First Name	**Last Name**	**Telephone Number**	**Email Address**	**Organization Name**	**IRN**	**Address**	**Delete Contact**
Faith	Knutsen	740-593-0830	knutsenf@ohio.edu	Ohio University	063024	HDL Center Suite 279, Athens, OH, 45701	
Nancy	Stevens	740-597-2785	stevensn@ohio.edu	Ohio University	063024	HDL Center Suite 279, Athens, OH, 45701	
Thomas	Parsons	740-797-4544	tparsons@athenscsd.org	Athens City	043521	25 S Plains Rd, The Plains, OH, 45780-1333	

Implementation Team

Ohio University (063024) - Athens County - 2017 - Straight A Fund - Rev 0 - Straight A Fund

Sections

Implementation Team						
First Name	Last Name	Title	Responsibilities	Qualifications	Prior Relevant Experience	Educa
Robert L.	Williams II	Professor	Mechanical Engineering co-PI. Graduate student advisor, 3D printing machine design, programming, and implementation	30 years' experience in kinematics, dynamics, robotics, and controls research	Delta Robot publication - for 3D printer application. http://www.ohio.edu/people/williar4/html/pdf/DeltaKin.pdf MS thesis: Joe Oberhauser, "Design, Construction, Control, and Analysis of Linear Delta Robot 3D Printer", March 25, 2016, Dr. Williams, advisor. Recent journal articles: E. Kljuno, J.J. Zhu, and R.L. Williams II, 2016, "A Biomimetic Elastic Cable-Driven Quadruped Robot: Design, Dynamics, and Controls", accepted, Austin Journal of Robotics & Automation, February 2016. E. Karadogan and R.L. Williams II, 2013, "The Robotic Lumbar Spine (RLS): Dynamics and Feedback Linearization Control", Hindawi Journal of Computational and Mathematical Models in Medicine, special issue on Numerical Methods and Applications in Biomechanical Modeling, doi: 10.1155/2013/985248, 12 pages. D.R. Moore, R.L. Williams II, T. Luo, E. Karadogan, 2013, "Elusive Achievement Effects of Haptic Feedback",Journal of Interactive Learning Research, JILR 24(3): 329-347. R.L. Williams II, 2013, "Simplified Robotics Joint-Space Trajectory Generation with Via Point using a Single Polynomial", Hindawi Journal of Robotics, Article ID 735958, 6 pages, March, doi: 10.1155/2013/735958. E. Karadogan and R.L. Williams II, 2013, "Haptic Modules for Palpatory Diagnosis Training of Medical Students", Virtual Reality Journal, Springer, 17(1): 45-48. E. Karadogan and R.L. Williams II, 2012, "Three-Dimensional Static Modeling of the Lumbar Spine", Journal of Biomechanical Engineering, Transactions of the ASME, 134(8): 084504-1-084504-5.	Ph.D. Mechanic Engineer VirginiaT Parallel r mechani 1988
Nancy	Stevens	Professor	Museum liaison for STEAM/science integration, graduate student mentorship, Design Cafe outreach, transdisciplinary museum design.	25 years of experience in museum outreach, exhibit development, and visitor engagement. 20 years of research in kinematics and dynamics of locomotion in animal models, comparative morphology including 3D printing applications of scientific specimens for exhibits and outreach. 10 years of student mentorship and immersive field and laboratory training, student outreach	Appointments: Professor, 2014-present, Dept. of Biomedical Sciences, Ohio University Associate Professor, 2011-2014, Dept. of Biomedical Sciences, OhioUniversity Assistant Professor, 2006-2011, Dept. of Biomedical Sciences, OhioUniversity Director, Patient-Centered Continuum, 2003-present, Ohio UniversityCollege of Osteopathic Medicine Postdoctoral Research Fellow, Department of BiomedicalSciences, Ohio University, 2001-2003. Assistant Director,Women in Science and Engineering, Stony Brook University, New York,1999-2001. Grants (last 5years): LSB Leakey Foundation "Primate diversification in the lateOligocene Nsungwe Formation of Tanzania.", (PI; 2016) $24,080 National Science Foundation "Collaborative Research: From dinosaurs to Primates: 100 Million Yearsof Biotic and Tectonic Evolution in the Western Branch of the East African RiftSystem", (co-PI; 2014-2017) $309,516 Belgian Research Action through Interdisciplinary Networks"PALEURAFRICA: Origin of the European modern faunas through Palaeogene CentralAfrica collections", (co-PI; 2013-2017) USD$1,196,710 National Science Foundation "Supplemental Funding: Oligocene Vertebrates from the Rukwa Rift Basinof Tanzania", (PI; 2013-2014) $26,397 National Science Foundation "Oligocene Vertebrates from the Rukwa Rift Basin of Tanzania", (PI;2011-2014) $197,793 National Science Foundation "Earth Sciences Early Career:	Ph.D. in Anthropo Sciences Stony Bro University 2003; M.S Anthropo Stony Bro University 1999

				programs in rural underserved areas. 10 years of continuous extramurally-funded international research projects on morphology as PI.	Acquisition of a vertebrate paleontologyspecimen preparation facility", (PI; 2009-2012) $180,000 National Science Foundation "Major Research Instrumentation:Acquisition of Instrumentation for Comparative Experimental BiomechanicsResearch" (co-PI; 2009-2012) $399,000 LSB Leakey Foundation "Oligocene primates from the NsungweFormation of Tanzania", (PI; 2011) $19,500 National Geographic Society "Vertebrate Paleontology of theEast African Rift System: Uniting Middle Cretaceous Sequences in Tanzania andMalawi", (co-PI; 2011) $22,975	
Neil	Littell	Assistant Professor	Engineering Design support, Executor of Training and Workforce Development support	PhD in Workforce Development from Mississippi State University	Award winning product designer, Engineering Program Manager for Viking Range, LLC. 2008-2014. Teaches engineering design and a product design centric capstone course.	PhD, Wo Developr Mississip State University 2013; MS Technolo Mississip State University 2004
Keerti S.	Kappagantula	Assistant Professor	As co-PI, Dr. Kappagantula will be responsible for developing material systems suitable for different additive manufacturing processes.	Dr. Kappagantula has over 6 years of experience working with material systems design, synthesis and characterization. She is interested in studying energy pathways in materials, along with synthesizing new-age composites suitable for immediate industry application.	For the past two years, Dr. Kappagantula has actively engaged in 3D printing material systems design. She has successfully fabricated and printed PLA/CNT systems with enhanced thermal and mechanical properties. She is currently developing biological powder printing system and energetic material printing with nanoscale precision. She has expertise in handling in polymers, nanomaterials, metals, composites and energetic systems suitable for variegated experience as is evidenced by her prolific publication and funding record.	Dr. Kappaga obtained PhD (201 and MSM (2010) fr Texas Te University a BSME (from And University (India).
Jesus	Pagan	Assistant Professor	As lead applicant, Mr. Pagan will be responsible for the overall vision and communication with key partners and collaborators within the grant. He will be responsible for scheduling meetings and coordination of the data collection as well as reporting duties of performance measures and metrics.	Mr. Pagan has over 15 year of consulting experience in the robotics and automation field. He was the president of Zeus Robotics, an Athens based consulting company that provided technical and educational services for welding automation. He was the assistant director to the Center for Algal Engineering Research and Commercialization (CAERC) and the	For the past three years, Mr. Pagan has worked with the Innovation Center supporting their effort to provide access to 3D printing services for rapid prototyping and research support. He and a multi-disciplinary team from the Russ College of Engineering has been working on the development of new materials for powder based 3D printing. While at the CAERC, he helped managed the acquisition and deployment of various instruments for algal research as well as assisted with the training of undergraduate and graduate students. He was also instrumental in the development of a hands-on STEAM Manufacturing Camp for middle school age students with tours of regional manufacturing companies in biotechnology, energy and food production fields.	Mr. Paga a B.S. an in Weldin Engineer from The State University

				Institute for Sustainable Energy and the Environment at Ohio University before taking a faculty position with the Engineering Technology and Management Department. His areas of research include automation controls, applied robotics and additive manufacturing.		
Marsha	Lewis	Associate Professor	Lewis will lead the external evaluation of the project	Marsha Lewis is an associate professor at Ohio University's George V. Voinovich School of Leadership and Public Affairs. She teaches courses in program evaluation, quantitative methods, and public sector strategy and manages multiple applied research projects focused mostly on education policy and practice. She also serves as a senior data analyst for the School's research and evaluation projects. Marsha helped develop the Ohio University Executive Leadership Institute and served as the Institute's managing director for five years. Dr. Lewis is one of Ohio University's lead researchers in the Ohio Education Research Center and serves as the Center's Policy and Agency Lead.	Dr. Lewis has conducted program evaluations of educational interventions for two decades. She is currently one of the lead evaluators of the Ohio Appalachian Collaborative Personalized Learning Network Straight A project, as well as the statewide evaluation of the Ohio Resident Educator Program.	Lewis ha master's degree in public administr and PhD educatio research evaluatio
Yuqui	You	Associate Professor	Developing and implementing a virtual module	Dr. You has experience in developing web-	Some Related Publications: -You, Y., Ding, C., "Design and Analysis of a LabVIEW & Arduino based Automatic Solar Tracking System", International Journal of	PhD Technolo Manager

			for online access to 3D printing/additive manufacturing knowledge base, and remote access to 3D printers.	based virtual manufacturing control systems, and manufacturing system integrations. She has developed remote online control and monitoring modules for process control systems, industrial robots, and manufacturing control systems. She is familiar with LabVIEW, .NET, and other tools and their integration with control system hardware.	Engineering Research and Innovation, 2016. -You, Y., Cheng, C., "The Design and Comparison of Single Inverted Pendulum System Controllers", International Journal of Modern Engineering, 2015. -Chapter contribution to the book "Internet accessible remote laboratories: scalable e-Learning tools for engineering and science disciplines", edited by Abul K. M. Azad, Northern Illinois University, USA; Michael E. Auer, Carinthia University of Applied Sciences, Austria; and Judson Harward, Massachusetts Institute of Technology, USA. Idea Group Inc. 2011. -You, Y., A project-oriented approach in teaching robotics application engineering, American Society of Engineering Education (ASEE) Annual Conference Proceeding, 2009. -You, Y., A Web-based Integration Module for Manufacturing Automation: Procedure and Analysis, Journal of Technology Interface, 2008 fall issue. -You, Y., Li, X., Mason, S., and Alungbe, G., Development of an online laboratory for computer-integrated courses, ASEE Annual Conference Proceedings, 2008. -You, Y., Developing a new curriculum in robotics interfacing engineering, ASEE Annual Conference Proceedings, 2008. -You, Y., Its all in the LAN, Manufacturing remote control over a local area network, InTech, ISA, August 2008. -You, Y., Remote manufacturing control, the 54th International Instrumentation Symposium Proceeding of the International Society of Automation (ISA), 2007	MS Indus Educatio Technolo BEng Po and Automati Eng.
Edward	Pauley	Director, Kennedy Museum of Art	Liaison between the museum and the project personnel	Prior to assuming the Kennedy directorship, 12 years' experience in administration of museums of art and science programming as Director of Education at Huntington Museum of Art	Co-development of Museum Certificate Program at Ohio University Selected Exhibitions: ? A Brush with Color: The Science of Color. (an interactive exhibition) ? Tomb: Ritual Processes and Regalia of ancient Egypt (an interactive exhibition) ? The History, Science and Art of Animation (an interactive exhibition) ? This House Under Construction ? Walter Gropius, Structure and Light.	M.F.A, 19 Ohio Univ
Sally	Delgado	Curator of Education	Curator of Education, Kennedy Museum of Art	30 years' experience in museum outreach and educational efforts	Co-development of Museum Studies Certificate Program at Ohio University Co-Instructor, ART 3100/5100 Museum Fundamentals I (Fall Semesters) and ART 3922/5922 Museum Fundamentals II - Practicum (Spring Semesters) (2013-present) Development of Museum class sessions for the following Ohio University courses: EDEC 3003 Junior Clinical Experiences II (2012-present) EDMC 3010 Curriculum Development in Middle Childhood (2012-present) EDMC 3500 Teaching Middle Childhood Social Studies (2015-present)UC 1900 Learning Community Seminars (2007-present) EDEC 3801 (previously HCCF/EDEC363: Creative Experiences): Play and Creativity in Early Childhood Education (2002-present) ART260 Foundations of Art Education (2004-2007) EDEC350 Teaching Social Studies in Early Childhood (2003-2008) EDEC225 Emerging Literacy in Early Childhood (2003-2006) ART564 Museum and Community Art Education (1999-2007) Development and supervision of community art workshops, "Art Encounters": 2011-present taught by Museum staff, student interns, and contract instructors 1996-2006 taught by graduate Art Education students Supervision of AH468 Service Learning in Art History and ART468 Service Learning in the Visual Arts projects Development of Visual Literacy Workshop for Friends of Kennedy Museum (2016) Development of Study Guide	MFA Pain 1986, Ya University

					and Field Guide in conjunction with Collections Collected: The University Collects and Athens Collects Miniatures (a Project with Mark Dion) (2009) Development and supervision of gallery and studio programs for Ohio University Kids on Campus Summer Programs, taught by undergraduate and graduate Art Education and Painting students (1997-2007) Merging Concepts I & II (2015, 2016): Museum Studies cross-disciplinary class exhibitions. Education Gallery Exhibition Projects with student interns at KMA: -Two Grey Hills: Navajo Master Weavers from the Edwin L. and Ruth E. Kenne -Editorial Isla Negra - POESIA E IMAGEN: 22 a?os portadas y dialogos (2014 collaborat	
Faith	Knutsen	Asociate Director, TechGrowth OHIO	Management of a collegial and educational 'maker's competition,' akin to a venture 'pitch competition,' as part of the additive manufacturing program between multiple regional schools.	Ms. Knutsen has over twenty-five years' experience as a grant program manager and operations manager. Since 2007 she is the Associate Director of Operations of TechGROWTH Ohio, a technology venture development program operated by the Voinovich School of leadership and Public Affairs, with responsibilities in overall program administration and regional outreach. Since 2014, she is a co-facilitator on a venture development training program in sub-Saharan Africa through the Scripps School of Journalism at Ohio University.	Since 2010, Ms. Knutsen has initiated, organized, and implemented multiple education venture development and venture pitch competitions between individuals and schools overseas and in SE Ohio.	MA from University (1992) ar BA from Oberlin College i Oberlin, O (1984); C Federal Governm Contracti from GW 2008