Opening Pathways to Employment through Nontraditional Geospatial Applications in Technical Education (OPEN-GATE)
Year 1 Annual Evaluation Report
DUE 1601552

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Evaluation Summary – Year One

This report was produced to accompany the Principal Investigator's annual report with a report cutoff date of May 31, 2017. A full review of first year outcomes that will include summer 2017 activities will be developed subsequent to Sept 1, 2017.

Project Overview – OPEN-GATE Measures of Success

The two over-arching goals of OPEN-GATE are:

1) Expanding access to education and training in geospatial technologies and
2) Increasing adoption of geospatial technologies statewide to support economic development and the growth of a spatially-enabled workforce.

Surveys of businesses across Arkansas indicate a need for a workforce with spatial skillsets rather than geospatial specialists, particularly in rural areas (which is most of Arkansas.) This project has been designed to address a void in geospatial education and training in Arkansas by building capacity in educators across an educational Continuum (K-12 through undergraduate, with a special focus on two-year Colleges.) Such capacity-building allows educators to integrate geospatial technologies into existing curricula to reinforce content as students develop relevant spatial skillsets that are directly applicable to their studies and marketable to future employers. The proposal lists specific objectives necessary to accomplish proposed goals and provided a general timeline for key events that supported these objectives, based on the semester of anticipated completion.

In order to achieve the overarching goals, OPEN-GATE has developed performance objectives that will result in:

1) Fostered partnerships and close collaboration between industry, educators, and students at all levels to define regionally specific skillsets, assess performance of new hires, and use this input to fine-tune educational offerings.
2) Creation of Employer Advisory Boards (EABs) at each two-year institution, composed of representatives of targeted industry (based on pilot degree program for geospatially-augmented instruction) and local business leaders to raise visibility of geospatial applications locally.

3) Hosting of one (1) Employer-Student outreach event at each partner institution annually, such as a GIS Day, to bring together local employers, GIS professionals, two-year College students, and local secondary school teachers and students.
4) Articulate strategies for the development and expansion of geospatially-augmented curricula in existing degree programs at two-year institutions and develop a system-wide structure for continuing education and certification in applied geospatial technologies.

Project Funding Period

The project commenced on July 15, 2016 and will conclude on June 30, 2019.

Evaluation Details

The project team and external evaluator will use the project logic model for formative and summative evaluation. The logic model will be used as a visual depiction of the project, as a communication tool, and as a road map for the evaluation. Inputs, processes, outputs, and outcomes will guide management of the project activities, outcomes, and products through formative and summative evaluation. Specifically, the logic model will be used to document and communicate:

1) The activities supported by the project. (*Activities*)
2) The tangible outputs generated from project activities. (*Outputs ~ Reach, Participation, and Reaction*)
    a. Who was reached? (who, how many)
    b. What were participants' reactions to activities?
    c. What is the quality/utility of the activities and products?
3) What project beneficiaries need to know and be able to do. (*Short-Term Outcomes ~ Learning*)
    a. How did the activities affect participants' knowledge, skills, abilities, or attitudes.
4) What should be done differently as a result of the project. (*Mid-Term Outcomes ~ Behavior*)

    a. To what extent did participants change their behavior because of what they learned?
    b. What would have/have not happened in the absence of the project?
5) How the long-term goals of the project align with the ATE program. (*Long-Term Outcomes ~ Results*)
    a. What is the cumulative effect of the project's outcomes?
    b. What aspects of the project are sustainable?
    c. What was transformative about the project?

Both quantitative and qualitative data will be collected and analyzed.

Evaluation Activities

Evaluation activities for this grant will achieve the following aims:

- Provide both quantitative and qualitative evaluation data;
- Focus on both results and process evaluation, including capture and documentation of unanticipated outcomes, along with unanticipated issues and their resolution;
- Report project progress relative to the original grant proposal and to previous progress; and,
- Measure project effectiveness and impact on the project's main target constituencies.

This plan includes both formative and summative evaluation activities. Formative evaluation will assess the impact of project resources, tools, and techniques at key intervals during the project, and advise the project team on where changes and amendments are warranted. Lessons learned and other evaluation findings will be shared with the greater STEM educational community and related science education organizations. Formative evaluation will also assess advancement in meeting project goals and on identifying, which activities are contributing to this progress, and it will also include a systematic attempt to assess unanticipated benefits and obstacles. The formative evaluation process will also assess the impact of project activities and outcomes attainment.

A summative evaluation will focus on the overall project success in achieving its goals and objectives, along with generating positive and constructive outcomes including the consequences of unanticipated outcomes.

A key outcome will also be to determine what aspects or components of the project were most effective in motivating faculty to integrate geospatial technologies into existing curriculum and impact student learning and marketability to future employers.

student behavior or changing perception of a technician career. The evaluation and study will lead to a more sophisticated understanding of what aspects of video content best influences consumer attitudes and motivates behavior.

RESEARCH QUESTIONS	DATA COLLECTION TOOLS & METHODS
CYCLE ONE: Activities and interactions produce value in and of themselves, they can help answer questions, trigger out-of-the-box thinking, solve problems, and bring together Member Institutions.	
What are significant events?	Recording and tracking of curriculum modifications and modules, professional development, recruitment events, business and industry involvement by Member Institutions.
What is the level of participation?	Immediate end-of professional event and surveys, interviews with event attendees, six month follow-up survey.
How much content is created?	Tracking of number of courses modified and degree program modification by secondary and post-secondary institutions (count.)
How relevant is the content?	Interviews with focus groups and survey results. Student recruitment and retention (count). Student graduation (count). Student internships and job placement (count). Student articulation to bachelor degree programs (count.)
With whom did the project interact with and make connections?	Interviews with participating faculty, administrators and business and industry representatives.
CYCLE TWO: Knowledge created in individuals and throughout the community is the creation of knowledge capital. Knowledge capital is a collective good distributed across a community or network.	
Is the knowledge capital of value to the member organizations?	Focus group with selected academic partners and survey instruments, growth in enrollments in involved classes.
Is the knowledge capital being used?	Focus group with selected academic partners and survey instruments as above.
CYCLE THREE: Knowledge capital is adapted and applied in different contexts by member institutions (secondary and postsecondary) and others.	
Is material from the project	Observation and focus group with academic members and

being used/re-used by members?	survey instruments, inventory of effected course curricula and content.
Are new initiatives being undertaken?	Focus group interviews, inventory of new courses utilizing OPEN-GATE materials.
Is learning being transferred within the project member institutions?	Focus group interviews- as above.
CYCLE FOUR: The use of resources, connections and practices from the project results in improvements in performance or new initiatives.	
Has performance within the field improved?	Focus group or individual interviews with industry personnel and representatives, exit and on-job interviews with graduates.
Is the project properly leveraging resources to gain more resources?	Tracking of number of courses developed and modified by member colleges.
Do members see community as worthwhile?	Tracking of number of people attending project events and professional development courses. Focus group interviews. Tracking student enrollment numbers (including gender, diversity, economic, adult students, and veterans) and dual enrollment. Tracking number of articulation agreements.
Are things being done "better" as a result of the project?	Focus group or individual interviews with industry personnel and faculty members.
Are knowledge products being created by project members as evidence of performance?	Tracking number of courses and modules created and focus group interviews.
Cycle Five: Social learning causes a reconsideration of the learning imperatives and the criteria by which they are defined. This involves sustainability and transforming or leaving behind existing structures and using new definitions to create a new framework for the community.	
Are there new frameworks for thinking about the technology domain?	Observation, focus group interviews, survey of Member Institutions and industry partners. Asking PIs to identify new discussions with Member Institutions personnel.
Are there institutional changes as a result of the project?	Focus group interviews, observations and interviews with school administrators.
Is there a new framework to guide the field?	Focus group interviews, observations and interviews with individuals from the geospatial and related fields.

Measures

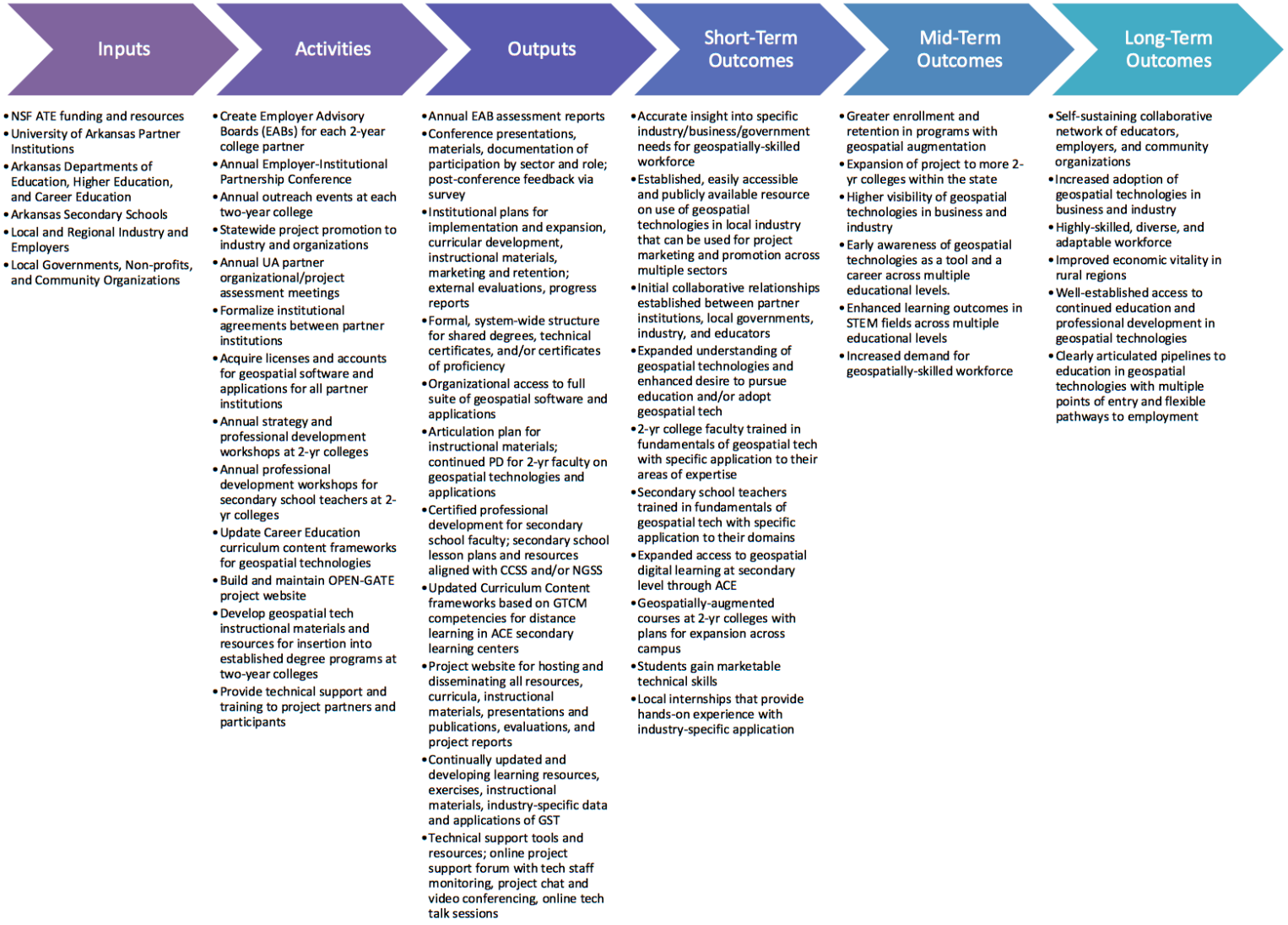
The external evaluator will conduct evaluation activities in accordance with an evaluation activities timeline (Table 1) which parallels the project timeline.

Table 1: Evaluation Plan -- Planned Summary Timeline

Evaluation Task/Deliverable	Jul-Sep 16	Oct-Dec 16	Jan-Mar 17	Apr-Jun 17	Jul-Sep 17	Oct-Dec 17	Jan-Mar 18	Apr-Jun 18	Jul-Sep 18	Oct-Dec 18	Jan-Mar 19	Apr-Jun 19
Assist with formative evaluation.												
Lead development of overall evaluation plan.												
Lead development of project-wide evaluation instruments as needed.												
Collect data on project activities.												
Attend, participate in project meetings.												
Work closely w/ PI's and staff; assess project effectiveness and impact.												
Monitor evaluation progress.												
Monitor project progress.												
Provide evaluation results to key stakeholders and audiences as appropriate.												
Lead summative evaluation.												
Lead preparation of annual evaluation reports for NSF.												
Submit Final Report (by July 2019 or tbd.)												-->

Project Inputs, Activities, Outputs, Short and Long Term Outcomes

A logic model has been developed, in which inputs, processes, outputs, and outcomes are monitored and used to guide management of the project activities, outcomes, and products through formative and summative evaluation.


Inputs
• NSF ATE funding and resources
• University of Arkansas Partner Institutions
• Arkansas Departments of Education, Higher Education, and Career Education
• Arkansas Secondary Schools
• Local and Regional Industry and Employers
• Local Governments, Non-profits, and Community Organizations
Activities
• Create Employer Advisory Boards (EABs) for each 2-year college partner
• Annual Employer-Institutional Partnership Conference
• Annual outreach events at each two-year college
• Statewide project promotion to industry and organizations
• Annual UA partner organizational/project assessment meetings
• Formalize institutional agreements between partner institutions
• Acquire licenses and accounts for geospatial software and applications for all partner institutions
• Annual strategy and professional development workshops at 2-yr colleges
• Annual professional development workshops for secondary school teachers at 2-yr colleges
• Update Career Education curriculum content frameworks for geospatial technologies
• Build and maintain OPEN-GATE project website
• Develop geospatial tech instructional materials and resources for insertion into established degree programs at two-year colleges
• Provide technical support and training to project partners and participants
Outputs
• Annual EAB assessment reports
• Conference presentations, materials, documentation of participation by sector and role; post-conference feedback via survey
• Institutional plans for implementation and expansion, curricular development, instructional materials, marketing and retention; external evaluations, progress reports
• Formal, system-wide structure for shared degrees, technical certificates, and/or certificates of proficiency
• Organizational access to full suite of geospatial software and applications
• Articulation plan for instructional materials; continued PD for 2-yr faculty on geospatial technologies and applications
• Certified professional development for secondary school faculty; secondary school lesson plans and resources aligned with CCSS and/or NGSS
• Updated Curriculum Content frameworks based on GTCM competencies for distance learning in ACE secondary learning centers
• Project website for hosting and disseminating all resources, curricula, instructional materials, presentations and publications, evaluations, and project reports
• Continually updated and developing learning resources, exercises, instructional materials, industry-specific data and applications of GST
• Technical support tools and resources; online project support forum with tech staff monitoring, project chat and video conferencing, online tech talk sessions
Short-Term Outcomes
• Accurate insight into specific industry/business/government needs for geospatially-skilled workforce
• Established, easily accessible and publicly available resource on use of geospatial technologies in local industry that can be used for project marketing and promotion across multiple sectors
• Initial collaborative relationships established between partner institutions, local governments, industry, and educators
• Expanded understanding of geospatial technologies and enhanced desire to pursue education and/or adopt geospatial tech
• 2-yr college faculty trained in fundamentals of geospatial tech with specific application to their areas of expertise
• Secondary school teachers trained in fundamentals of geospatial tech with specific application to their domains
• Expanded access to geospatial digital learning at secondary level through ACE
• Geospatially-augmented courses at 2-yr colleges with plans for expansion across campus
• Students gain marketable technical skills
• Local internships that provide hands-on experience with industry-specific application
Mid-Term Outcomes
• Greater enrollment and retention in programs with geospatial augmentation
• Expansion of project to more 2-yr colleges within the state
• Higher visibility of geospatial technologies in business and industry
• Early awareness of geospatial technologies as a tool and a career across multiple educational levels.
• Enhanced learning outcomes in STEM fields across multiple educational levels
• Increased demand for geospatially-skilled workforce
Long-Term Outcomes
• Self-sustaining collaborative network of educators, employers, and community organizations
• Increased adoption of geospatial technologies in business and industry
• Highly-skilled, diverse, and adaptable workforce
• Improved economic vitality in rural regions
• Well-established access to continued education and professional development in geospatial technologies
• Clearly articulated pipelines to education in geospatial technologies with multiple points of entry and flexible pathways to employment

Results including Informal Feedback

Year one has focused on expanding access to education and training in geospatial technologies. In this phase, objectives supported capacity-building and curriculum development at the secondary school and two-year college levels; coordination, collaboration, and information sharing among the partners; and initial outreach to communities of interest.

Goal 1: Increase adoption of geospatial technologies in industry and government.

a) Foster partnerships and close collaboration between industry, educators, and students at all levels to define regionally specific skillsets, assess performance of new hires, and use this input to fine-tune educational offerings.
b) Create Employer Advisory Boards (EABs) at each two-year institution, composed of representatives of targeted industry (based on pilot degree program for geospatially-augmented instruction) and local business leaders (to raise visibility of geospatial applications locally.)
    - Anticipated completion: Fall 2016; May 2017 status: 2 of 4 created in Year 1.
c) Host one (1) Employer-Student outreach event at each partner institution annually, such as a GIS Day, to bring together local employers, GIS professionals, two-year College students, and local secondary School teachers and students
    - Anticipated completion: Spring 2017; May 2017 status: 2 of 4 completed for Year 1.

Goal 2: Expand access to education and training in geospatial technologies at two-year institutions and secondary schools, articulating multiple points of entry and pathways to education and employment.

a) Articulate strategies for the development and expansion of geospatially-augmented curricula in existing degree programs at two-year institutions and develop a system-wide structure for continuing education and certification in applied geospatial technologies.
b) Conduct one (1) in-person planning meeting in the first year, with teleconference follow-up, for administrators, educators, OPEN-GATE staff, and evaluator.

- Anticipated completion: Fall 2016; status: completed January 19–20, 2017.

c) Build capacity in geospatial technology education at two-year institutions.
   - Acquire licenses and accounts for geospatial software and applications for partner institutions.
     - Anticipated completion: Fall 2016; May 2017 status: 70% complete.
   - Strategy and professional development workshops each year at partner institutions for campus champions and other interested faculty.
     - Anticipated completion: Fall 2016-Spring 2017, May 2017 status: 3 of 4 visits completed in Year 1.

d) Foster adoption of geospatial technologies at the secondary school level in support of STEM learning and the availability of local educational pathways at regional two-year colleges.
   - Coordinate with the Arkansas Department of Education to build professional development workshops for secondary school educators.
     - Anticipated completion: May 2017 status: completed March 2017.
   - Coordinate with the Arkansas Department of Career Education (ACE) to update existing curriculum content frameworks for geospatial technologies and increase utilization of curriculum through digital learning.
     - Anticipated completion: Spring Summer 2017; May 2017 status: 20% complete.

e) Provide ongoing support and resource development for two-year and secondary school institutions and employers
   - Launch and maintain project website.
     - Anticipated completion: Spring 2017, May 2017 status: Website launched April 2017: Content generation ongoing.
     - https://cast.uark.edu/cast-outreach/outreach-OPEN-GATE.php
   - Ongoing development of instructional materials and resources for insertion into existing courses in established degree programs by campus champions and OPEN-GATE staff.
     - Begun Spring 2017 and currently ongoing.

Recommendations

Project award notification was received on July 13, 2016 with a start date of July 15, a difficult time with summer vacation schedules and faculty preparing courses for the fall semester. The planning meeting, held in January 2017 effectively communicated the goals and objectives of the grant to all project stakeholders:

- Both UA-Batesville and UA-Cossatot had faculty directly involved in the proposal process and were able to come up to speed quickly due to familiarity and commitment to the project.
- At UA-Morrilton, the campus champion was selected very near the end of the grant proposal writing, and through either miscommunication or misinformation there was some confusion that was addressed as the professor incorrectly believed that her efforts would be in addition to her regular summer teaching duties rather than being relieved of them to work on the project.
- At UA-Phillips, staff turnover caused delays in the selection of a campus champion, which has in turn delayed other critical activities necessary to implement the project on the college campus.

There were some initial delays and the project team that have been addressed. Project PI's have done a good job bringing both UA- Morrilton and UA-Phillips on track. Now that the project personnel on each campus are in place and summer workshop data is being collected, the evaluator will be monitoring an increasing flow of data and interpret that data in light of the evaluation plan.

Summary

As of June 2017, the formative elements of the project are now in-place and impact data is being collected. A more complete analysis of early impact data will now begin with the evaluator collecting summer workshop survey data and conducting focused interviews with the project implementation team. This information will be presented in a Fall 2017 follow-up evaluation report.

Appendices

OPENGATE Summer 2017 PD Survey

Background and purpose of survey

Text

Information for survey respondents and interview participants:

The OPENGATE project has been made possible through a grant from the National Science Foundation, which requires regular evaluation and assessment of project activities. As a participant in the educational and professional development activities funded by NSF, we request your feedback in order to meet these requirements. Your participation is strictly voluntary and all answers will remain confidential to the extent allowed by law and University policy. The feedback you provide will be aggregated with other participants in these educational activities and professional development and will be shared with the participating educational institutions in the University of Arkansas System as well as the National Science Foundation in order to evaluate the efficacy of the project in accordance with its stated goal of expanding access to education and training in geospatial technologies in Arkansas.

Any questions about this project may be directed to:

Dr. Robyn Lane, Project Director
University of Arkansas Center for Advanced Spatial Technologies
JBHT 304
1 University of Arkansas
Fayetteville, Arkansas 72701
479-575-5639
robyn@cast.uark.edu

For questions or concerns about your rights as a research participant, please contact Ro Windwalker, the University's Compliance Coordinator, at (479) 575-2208 or by email at irb@uark.edu.

Default Question Block

I am...

- ○ Male
- ○ Female

What is your age?

- ○ 18 to 19
- ○ 20 to 24
- ○ 25 to 29
- ○ 30 to 34
- ○ 35 to 44
- ○ 45 to 54
- ○ 55 to 64
- ○ 65 or over

What is your ethnicity?

- ○ American Indian/Alaskan
- ○ Asian
- ○ Black
- ○ Hawaiian or Pacific Islander
- ○ Hispanic
- ○ White
- ○ Two or more ethnicities
- ○ Prefer not to say

I am...

- ○ an undergraduate student
- ○ a college or university educator
- ○ a K-12 educator
- ○ a professional in geospatial technologies
- ○ a user of geospatial technologies (mapping, routing, address location, etc.) in my profession
- ○ a community partner
- ○ Other

How many years have you been employed as an educator?

- ○ 0 to 5
- ○ 6 to 10
- ○ 11 to 15
- ○ 16 to 20
- ○ 20 or more

In what content area do you teach?

- ○ Natural Sciences
- ○ Social Sciences
- ○ Mathematics
- ○ Business
- ○ Technology
- ○ Languages and the Arts
- ○ Other

Please estimate the combined student gender breakdown for the classes in which the workshop content will be used.

Male	0 %
Female	0 %
Total	0 %

Please estimate the combined student racial breakdown for the classes in which the workshop content will be used.

American Indian or Alaska Native	0 %
Asian	0 %
Black or African American	0 %
Native Hawaiian or other Pacific Islander	0 %
White or Caucasian	0 %
Total	0 %

What is the name of the course in which you are enrolled?

Where are you taking this course or professional development workshop?

- ○ University of Arkansas Community College - Cossatot
- ○ Phillips Community College-University of Arkansas
- ○ University of Arkansas Community College-Batesville
- ○ University of Arkansas Community College-Morrilton
- ○ University of Arkansas - Fayetteville

How would you rate the overall quality of this...

	Poor	Fair	Good	Very Good	Excellent
Course or workshop?	○	○	○	○	○
Instructor?	○	○	○	○	○

	Poor	Fair	Good	Very Good	Excellent
Educational materials provided?	O	O	O	O	O
Technological Support?	O	O	O	O	O

Please rate the professional development seminar facilities in terms of...

	Poor	Fair	Good	Very Good	Excellent	Not Applicable
Overall quality	O	O	O	O	O	O
Event venue (location,ease of access, parking)	O	O	O	O	O	O
Event facilities (meeting rooms, internet access, other required technologies or amenities)	O	O	O	O	O	O
Event staff	O	O	O	O	O	O
Meals and snacks	O	O	O	O	O	O
Opportunities for formal and informal networking	O	O	O	O	O	O
Opportunities for education and training	O	O	O	O	O	O

Please rate professional development seminar content and materials in terms of the following...

	Poor	Fair	Good	Very Good	Excellent
Overall quality	O	O	O	O	O
Value of the topic	O	O	O	O	O
Relevance of the information presented	O	O	O	O	O
Expertise of the speaker or presenter	O	O	O	O	O
Time allocated to technological training	O	O	O	O	O

	Poor	Fair	Good	Very Good	Excellent
Time allocated to pedagogical and/or practical application of technology	○	○	○	○	○

What is the extent of your previous education in geospatial technologies?

- ○ I have no previous education.
- ○ I have taught myself about geospatial technologies using books, online resources, or self-guided tutorials.
- ○ I have taken one or more instructor-led short courses/workshops for professional development.
- ○ I have taken one or more college or university courses that include some exposure to geospatial technologies.
- ○ I have taken one or more college or university courses specifically on geospatial technologies.

What is your experience with geospatial technologies in your content area, area of expertise, or related fields of employment?

- ○ I have no previous experience with geospatial technologies.
- ○ I have some experience with geospatial technologies through field work or research in my job as an educator.
- ○ I have used geospatial technologies in a work setting, apart from my job as an educator.

Please respond to the following statements.

	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
I found the workshop content to be too difficult for my students.	○	○	○	○	○
I found the workshop content to be useful and relevant to my subject matter.	○	○	○	○	○

	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
I would recommend this workshop to other teachers who teach similar courses.	○	○	○	○	○

At the beginning of this class, how would you rate your knowledge or experience of...

	Totally new to me					Very knowledgeable or experienced
	1	2	3	3	4	5
Fundamental theory and concepts in geospatial technologies?						
How geospatial technologies are applied in your area of expertise and related fields of employment?						
Personally using geospatial tecnologies in work or research?						

One of the purposes of this professional development seminar is to raise the visibility of geospatial technologies (mapping, routing and navigation, and other location-based information) in education, business, and as a career path.

Please rate, on a scale of 1 to 10, your awareness or experience of geospatial technologies in general...

	1	2	3	4	5	6	6	7	8	9	10
Before participating in this event											
After participating in this event											

Please rate, on a scale of 1 to 10, your knowledge of how geospatial technologies are relevant to your specific industry, area of interest, or area of expertise.

	1	2	3	4	5	6	6	7	8	9	10
Before participating in this event											
After participating in this event											

Please rate, on a scale of 1 to 10, your skill in using geospatial technologies to support your specific industry, area of interest, or area of expertise.

	1	2	3	4	5	6	6	7	8	9	10
Before participating in this event											
After participating in this event											

Please rate, on a scale of 1 to 10, your intention to apply geospatial technologies in the future in your industry, area of interest, or area of expertise.

	1	2	3	4	5	6	6	7	8	9	10
Before participating in this event											
After participating in this event											

Overall, how effective do you feel this professional development seminar was in helping you...

	Very Ineffective	Ineffective	Neither Effective nor Ineffective	Effective	Very Effective

	Very Ineffective	Ineffective	Neither Effective nor Ineffective	Effective	Very Effective
understand fundamental concepts of geospatial technology?	○	○	○	○	○
understand how geospatial technology can be applied as a learning tool in your domain?	○	○	○	○	○
develop applications to use in your classroom to reinforce student learning?	○	○	○	○	○
understand and use the geospatial technology applications presented?	○	○	○	○	○

How many classroom instructional hours (or fractions of an hour) do you estimate will be devoted to the use of this content?

	0	1	2	3	4	5	6	7	8	9	10
Click to write Choice 1											

After taking this course, how confident are you in your abilities to...

	Very Unconfident	Somewhat Unconfident	Neither Confident Nor Unconfident	Somewhat Confident	Very Confident
Understand and identify spatial relationships between nature and society?	○	○	○	○	○
Understand how people and places are linked at local, regional, and global scales?	○	○	○	○	○

	Very Unconfident	Somewhat Unconfident	Neither Confident Nor Unconfident	Somewhat Confident	Very Confident
Identify, explain, and find meaning in spatial relationships?	○	○	○	○	○
Use GIS to aquire, manage, display, and analyze spatial data?	○	○	○	○	○
Make calculations, models, and inferences about space, spatial patterns, and spatial relationships?	○	○	○	○	○
Apply information, concepts, and methods of natural and social sciences to geographic questions and applications?	○	○	○	○	○
Create and edit maps and other visual representations of spatial data for the purpose of communicating information?	○	○	○	○	○

After taking this course, how confident are you in your abilities to...

	Very Unconfident	Somewhat Unconfident	Neither Confident Nor Unconfident	Somewhat Confident	Very Confident
Demonstrate a working knowledge of GIS hardware and software capabilities?	○	○	○	○	○
Understand and apply the concepts of coordinate systems and projections as they relate to geospatial technologies?	○	○	○	○	○

	Very Unconfident	Somewhat Unconfident	Neither Confident Nor Unconfident	Somewhat Confident	Very Confident
Understand and apply concepts of data quality and accuracy in geospatial technologies?	○	○	○	○	○
Understand and apply concepts of spatial data models, structures, and classifications, as well as their appropriate uses?	○	○	○	○	○
Acquire and integrate a variety of data types into a GIS?	○	○	○	○	○
Use geospatial hardware and software to perfom basic spatial analysis?	○	○	○	○	○
Identify potential sources of confusion, error, or inaccuracies in GIS analysis and interpretation of analytical results?	○	○	○	○	○

After taking this course, how confident are you in your abilities to design and execute a geospatial project by...

	Very Unconfident	Somewhat Unconfident	Neither Confident Nor Unconfident	Somewhat Confident	Very Confident
Planning and implementing a project timeline successfully?	○	○	○	○	○
Defining a problem using spatial questions (e.g., why is this here, how did it get here, what does it mean?)	○	○	○	○	○

	Very Unconfident	Somewhat Unconfident	Neither Confident Nor Unconfident	Somewhat Confident	Very Confident
Identifying necessary resources (hardware, software, and data) to solve the problem?	○	○	○	○	○
Developing a plan for acquiring or creating the necessary data?	○	○	○	○	○
Creating a model or methodology for analyzing the data?	○	○	○	○	○
Assessing data quality and accuracy based on analysis methods to be used?	○	○	○	○	○
Analyze the data and understand potential sources of error or inaccuracies that may impact what conclusions can be drawn?	○	○	○	○	○
Identify target audiences and appropriate media for sharing results?	○	○	○	○	○
Communicate the results of the project clearly and concisely using maps and/or other visualizations?	○	○	○	○	○
Communicate the results of the project clearly and concisely through oral and written communications?	○	○	○	○	○

How likely are you to...

	Very Unlikely	Unlikely	Somewhat Unlikely	Undecided	Somewhat Likely	Likely	Very Likely

	Very Unlikely	Unlikely	Somewhat Unlikely	Undecided	Somewhat Likely	Likely	Very Likely
Recommend this seminar to a friend or colleague?	O	O	O	O	O	O	O
Implement what you have learned in this seminar in your industry, area of interest, or area of expertise?	O	O	O	O	O	O	O
Continue to learn about geospatial technologies through formal structures, like courses or workshops?	O	O	O	O	O	O	O
Continue to learn about geospatial technologies through on-the-job experiences or internships?	O	O	O	O	O	O	O
Continue to learn about geospatial technologies through self-education?	O	O	O	O	O	O	O

Did participating in this professional development seminar impact your curriculum?

Did participating in this professional development seminar support any research activity?

Has your experience with geospatially-augmented instruction helped you develop marketable skill sets? Please explain.

Which part of the professional development seminar was most valuable to you?

Which part of the professional development seminar was least valuable to you?

What topics would you like to see included in future professional development seminars?

What additional elements would you like to see incorporated in future professional development seminars?

What, if anything, would you change about the professional development seminar?

Do you have any additional comments or suggestions?

OPENGATE background and purpose of survey

Information for survey respondents and interview participants:

The OPENGATE project has been made possible through a grant from the National Science Foundation, which requires regular evaluation and assessment of project activities. As a participant in the educational and professional development activities funded by NSF, we request your feedback in order to meet these requirements. Your participation is strictly voluntary and all answers will remain confidential to the extent allowed by law and University policy. The feedback you provide will be aggregated with other participants in these educational activities and professional development and will be shared with the participating educational institutions in the University of Arkansas System as well as the National Science Foundation in order to evaluate the efficacy of the project in accordance with its stated goal of expanding access to education and training in geospatial technologies in Arkansas.

Any questions about this project may be directed to:

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For questions or concerns about your rights as a research participant, please contact Ro Windwalker, the University's Compliance Coordinator, at (479) 575-2208 or by email at irb@uark.edu.