APPENDIX A

DATA COLLECTION FORM

CPATH PI Survey and Monitoring Tool

CPATH PI Survey and Monitoring Tool

Thank you for taking the time to complete this survey!

Information from this data collection system will be retained by the National Science Foundation, a federal agency, and will be an integral part of its Privacy Act System of Records in accordance with the Privacy Act of 1974 and maintained in the Education and Training System of Records 63 Fed. Reg. 264, 272 (January 5, 1998). These are confidential files accessible only to appropriate National Science Foundation (NSF) officials, their staffs, and their contractors responsible for monitoring, assessing, and evaluating NSF programs. Only data in highly aggregated form, or data explicitly requested as "for general use," will be made available to anyone outside of the National Science Foundation for research purposes. Data submitted will be used in accordance with criteria established by NSF for monitoring research and education grants, and in response to Public Law 99-383 and 42 USC 1885c.

Introduction

The purpose of this survey and monitoring tool is to gather baseline information on all grantees funded by the CPATH program.

Please plan to complete the survey no later than [DATE]. Survey instructions are provided below.

If you have any additional questions, please contact John Benskin at SRI International at 703-247-8497 or e-mail us at cpathmonitor@wdc.sri.com.

Definitions used in this survey

Computational Thinking

Although computational thinking is a complex and ever-evolving concept, for the purposes of this survey please consider computational thinking to involve "solving problems, designing systems, and understanding human behavior by drawing on concepts" from computer science (Wing 2006). Specifically, computational thinking involves different levels of abstraction to understand and solve problems and includes a range of mental tools that reflect and build on the breadth of the field of computer science. Additionally, computational thinking comprehensively encompasses computational concepts, methods, models, algorithms, and tools.

Partner

For the purposes of this survey, a partner refers to any organization outside of the project institution(s) that is a collaborator on CPATH project activities. These organizations include private businesses, K-12 schools or districts, community-based or non-profit organizations, or local government entities.

Participant

A participant refers primarily to undergraduate students who are the principal beneficiaries of the CPATH project activities. In some cases, participants may be community college students or K-

12 students and/or teachers.

Survey Instructions

Taking the Survey

Please use the onscreen navigation buttons while taking the survey, not the browser forward and back buttons. The following options will be available to you while taking the survey:

- Next>> – will move you ahead to the next group of questions
  <<Previous – will move you back to the previous group of questions
  Load unfinished survey – will allow you to load an unfinished survey using a name and password that you have created.
- Resume later – will allow you to save an unfinished survey. You will be asked to choose a name and password which you will be required to enter in order to return to and load your unfinished survey. If you enter an e-mail address in the "your e-mail" box, an e-mail with details will be sent to you. Please be aware that the e-mail will contain your password. If you do not wish to have your password sent in an e-mail, do not enter an e-mail address in the "your e-mail" box. Please keep your password in a safe place, as we will not be able to retrieve it for you.
- Review and submit – Please review your survey before you submit it to make sure all of your answers are correct. You can move back through the survey using the "<<Previous" button, and forward again with the "Next>>" button. Once you are sure all of your answers are correct, please press the "Submit" button on the last page to submit the survey.

Questions

Some of these questions will require that you look up project data such as student enrollment figures for your response. Instructions about the type of data needed are included with each question item.

There are 3 types of questions in this survey:

1. Multiple choice questions may ask you to choose only one response, or may give you the option of choosing more than one response.
2. Open response questions will require that you write your response in the text box provided.
3. Data entry tables will require you to fill in the appropriate numeric and/or short text response in the fields provided.

Additional instructions

- A PDF version of the survey is available at: [link to doc on cpathmonitor website]. We recommend that you download and read this version in order to familiarize yourself with the entire survey and gather the necessary information before you begin.
- Although this survey is addressed to PIs, some questions may need input from other persons associated with the project, such as project evaluators and institutional research staff. For example, question 1 collects information about students by racial, ethnic, gender, and other

characteristics; question 6 asks for names of courses and student enrollment figures from your institution.

- Mandatory questions are marked with an asterisk (*). You will not be able to proceed to the next group of questions in the online survey without answering mandatory questions.

- After submission, please note that you will not be able to access the survey again through the link you were sent. If for some reason you discover that you need to make changes after you have submitted your survey, you will need to contact John Benskin at SRI International at 703-247-8497 or e-mail us at cpathmonitor@wdc.sri.com.

Recognizing the diverse nature of the CPATH program, this monitoring survey has been designed to elicit information on different types of projects. Please approach each item with your particular project in mind and complete the item as accurately as possible as it relates to your CPATH project. If an item does not apply to your project, please put "N/A" in the response blank provided. Please attempt to fill in each item with a response.

Thank you for taking the time to complete this survey about your CPATH project!

_____

Please enter your name. ___

What is your role within the CPATH award? ____

Institutional Context and Project Background

The following four questions are about the project and your institution. They require you or others associated with your project to look up various numbers about student participation and course enrollments. Answering these first few questions will most likely take more time and effort than the rest of the survey. Since you may need to consult fellow project staff members for some of this information, please note that you are able to save this survey and return to it at a later time. While retrieving these numbers might take some time, your thorough responses will be highly appreciated.

1. The guidelines for the CPATH program suggest the target groups listed in the table below. For the previous project year [July 1, 2008-June 30, 2009], please enter the total numbers of student participants in your project for each group. Please enter "0" (zero) if none or "N/A" (not applicable). If the quantity is not known, please enter "unknown".

	Male	Female
American Indian or Alaska Native		
Asian		
Black or African American		
Native Hawaiian or Other Pacific Islander		
Hispanic or Latino		
White		
More than one race reported		
Students with disabilities		
Retrained mid-career professionals		
Race not known or reported		

2. Which of the following underrepresented groups have been targeted in classes or programs that promote computational thinking? Please choose **all that apply**:

   ☐ Females
   ☐ Students with Disabilities
   ☐ Traditionally underrepresented minorities (e.g., African-American, Native American, and Latino)
   ☐ Retrained mid-career professionals
   ☐ Non- computing-related majors
   ☐ Non-traditional computing related majors
   ☐ Economically disadvantaged students
   ☐ Not applicable
   ☐ Other: _____

3. How many courses incorporating computational thinking concepts are offered at your institution overall within and outside of traditionally computing-related disciplines? How many of these are targeted by your CPATH project? (Insert total number here or enter "0" (zero), "unknown" or "N/A" (not applicable) where appropriate.)

	Number of courses with computational thinking offered at your institution	*Number* of courses with computational thinking targeted by CPATH project
Within traditionally computing-related disciplines		
Outside of traditionally computing-related disciplines		

4. In the table below, please enter the title and enrollment of the courses targeted by the CPATH project that are offered at your institution, and their respective student enrollment for the previous and current academic years. Please enter "0" (zero), "unknown" or "N/A" (not applicable) where appropriate.

	Computing Related Course Title	Previous Academic Year Fall 2008-Summer 2009	Current Academic Year Fall 2009-Summer 2010
1			
2			
3			
4			
5			

If you have more courses targeted by the CPATH project to list, please continue to enter their titles and enrollment numbers in the table below. Please enter "0" (zero), "unknown" or "NA" (not applicable) where appropriate.

If you have no more courses to list, please press the "Next>>" button to move to the next question.

	Computing Related Course Title	Previous Academic Year Fall 2008-Summer 2009	Current Academic Year Fall 2009-Summer 2010
1			
2			
3			
4			
5			

Project Strategies

Please describe your project activities and strategies in the following questions:

5. As part of your project, which of the following curricular and pedagogical model types are you developing? Please choose **all that apply**:

☐ Course sequence revision
☐ New course offerings
☐ New degree programs
☐ Interdisciplinary diffusion
☐ New integrated majors
☐ STEM non-major courses
☐ Not applicable
☐ Other: _____

6. Which of the following activities describes your project as it relates to computational thinking across disciplines? Please choose **all that apply**:

☐ Outreach to non-traditional computer science students and departments on your campus
☐ Outreach to the K-12 system and/or other colleges and universities
☐ Outreach to the K-12 system and/or other colleges and universities
☐ Communication across departments regarding the value of computational thinking across disciplines
☐ Communication across departments regarding the value of computational thinking across disciplines
☐ Website/workshop/outreach to develop connection between computing disciplines and traditionally non-computing disciplines
☐ Website/workshop/outreach to develop connection between computing disciplines and traditionally non-computing disciplines
☐ Technology to support computational thinking
☐ Identification of computational thinking needs in traditionally non-computing disciplines
☐ Provision of services by the computer science department to other departments
☐ Integration of computational thinking into traditionally non-computing disciplines and departments
☐ Advisement/Mentoring/Tutoring
☐ Scholarships/fellowships/stipends for all students
☐ Scholarships/fellowships/stipends for traditionally underrepresented students
☐ Internships for all students
☐ Internships for traditionally underrepresented students
☐ Collaborative Research with Faculty

Project Contributors and Stakeholders

Please describe the various groups directly involved with your project activities.

7. Which of the following groups are directly participating in the project? Please identify the various groups involved, if applicable. Please choose **all that apply** and provide a comment:

   ☐ Higher education faculty
   ☐ Higher education students
   ☐ Higher education administrators
   ☐ Multiple departments/colleges at your institution (Please identify each)
   ☐ K-12 district teachers (Please identify each district and/or school)
   ☐ K-12 district students (Please identify each district and/or school)
   ☐ K-12 district administrators (Please identify each district and/or school)
   ☐ Industry and businesses (Please identify each)
   ☐ Professional associations (Please identify each)
   ☐ Other (Please specify): _____

8. Which group, if any, would you like your project to include that is not currently included? Please choose **only one** of the following:

   ○ Higher education faculty
   ○ Higher education students
   ○ Higher education administrators
   ○ Multiple departments/colleges at your institution
   ○ K-12 district teachers
   ○ K-12 district students
   ○ K-12 district administrators
   ○ Industry and businesses
   ○ Professional associations
   ○ None
   ○ Other: _____

The next set of questions asks you to identify the various stakeholders who have been engaged in computational thinking through your project.

9. Does your project do any of the following activities to engage stakeholders? Please choose **all that apply**:

   ☐ Extend an invitation to participate in the planning committee
   ☐ Develop a study to determine what stakeholders need/want in preparing students for computing disciplines
   ☐ Study/map stakeholders' computing needs in non-computing disciplines
   ☐ Organize a committee of stakeholder representatives to write a white paper about advancing computer education
   ☐ Develop ways to archive and share findings on computing education research (e.g., build a resource repository for stakeholder use)
   ☐ Attract media and press to local computing efforts

☐ Invite Stakeholders to attend relevant conferences/workshops
☐ Create and host online web-based community
☐ Create and share web-based tools and resources
☐ Not applicable
☐ Other: _____

10. What are the three main desired outcomes of this project overall? Please choose **at most 3** answers:

☐ Target and engage new student populations for participation
☐ Assess computational thinking competencies
☐ Support and encourage shared learning
☐ Promote multi-sector collaborations and partnerships
☐ Contribute to diverse industries
☐ STEM teacher preparation
☐ Not applicable
☐ Other: _____

Project Implementation

The following questions ask about the project implementation process.

11. What social and resource supports are available for faculty to bolster their curricular reform efforts around computational thinking *outside of and within traditional computing-related departments (e.g., computer science, informatics)*? Please choose **all that apply**:

☐ Professional development and training
☐ Technical support
☐ Advisement/mentoring
☐ Peer mentoring
☐ Co-teaching arrangements
☐ Administrative support
☐ Release time (i.e., to prepare for curriculum development)
☐ Not applicable
☐ Other: _____

12. In which of the following ways will the project contribute to the future expansion and definition of the field of computational thinking? Please choose **all that apply**:

☐ Identifying and sharing best practices
☐ Developing concrete curricular goals for students
☐ Fostering the capacity for abstract thinking through coursework
☐ Exploring teaching methods for improving teaching education
☐ Contributing to the body of research serving to define new computing concepts and methods
☐ Assessing student understanding, skills and competencies
☐ Not applicable
☐ Other: _____

Project Implementation Factors

In this section, please identify those factors that influence the implementation of your project. Keep in mind those things that have supported (i.e., facilitators) or hindered (i.e., barriers) project implementation.

13. Please indicate whether each of the following factors has been a facilitator or a barrier to the implementation of your project *overall*. Please choose **the appropriate** response for each item:

	Barrier	Facilitator	Not Applicable
Process for computing education reform	○	○	○
Cross-departmental communication	○	○	○
Infrastructure for inter-disciplinary studies	○	○	○
Procedure for making curricular changes	○	○	○
Attitudes towards reform	○	○	○
Financial resources	○	○	○
Pre-existing relationships with partner(s)	○	○	○

14. Is there any other factor not included in the previous question that has been either a facilitator or a barrier for the implementation of your project, *overall*? Please choose **only one** of the following:

○ Yes
○ No
○ Don't Know

If yes, please describe the factor(s) ___

15. Please indicate whether each of the following aspects of the project partnership has been a facilitator or a barrier to the implementation of your project overall. Please choose the appropriate response for each item:

	Barrier	Facilitator	Not Applicable
Communication	○	○	○
Resource Sharing	○	○	○
Networking ability/activity	○	○	○
Delegation of responsibility	○	○	○
Pre-existing relationships with partner organization(s)	○	○	○
Interdependence with partner organization	○	○	○
Partners' perception of mutual benefits	○	○	○
Alignment of partner expectations with outcomes	○	○	○

16. Is there any other aspect not included in the previous question that has been either a barrier or facilitator for the project partnership? Please choose **only one** of the following:

○ Yes
○ No
○ Don't Know

If yes, please describe barrier or facilitator.

17. Which of the following barriers and challenges does the project face in infusing computational thinking across disciplines? Please choose **all that apply**:

☐ Capacity of the administrative structure to support interdisciplinary programs
☐ Capacity of the administrative structure to support computational requirements
☐ Technology to support computational thinking curricula
☐ Availability of resources
☐ Infrastructure in other departments to support computational thinking
☐ Attitudes of non-computer science students and departments towards computational thinking
☐ Attracting non-traditional computer science and underrepresented students
☐ Identification of the needs of traditionally non-computing disciplines by computer science departments
☐ Traditional focus of computer science limiting the application of computational thinking in other disciplines

18. Are there other barriers and challenges to infusing computational thinking across disciplines not included in the previous question? Please choose **only one** of the following:

○ Yes
○ No
○ Don't Know

If yes, please identify these barriers. ___

Project Management

This final set of questions is about managing the project staff and finances.

19. Approximately how many people are on the staff (i.e., funded for the grant) for this project? _____

20. Please list project staff, their respective titles, responsibilities and approximate percent time dedicated to project activities.

	Name	Title	Responsibilities	Percent time dedicated to project activities
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				

21. How often do you communicate and coordinate with your project staff via the following means? Please choose **the appropriate** response for each item:

	Less than every other month	About every other month	About once a month	About every other week	About once a week or more
E-mail	○	○	○	○	○
Telephone	○	○	○	○	○
One-on-one meetings in-person	○	○	○	○	○
In-person team meetings	○	○	○	○	○
Conference calls	○	○	○	○	○
Video teleconferences	○	○	○	○	○
Other	○	○	○	○	○

22. Does your project have an evaluator?

○ Yes
○ No

If yes, please list the name and affiliation of the evaluator(s).

If no, please explain why not.

23. Do you receive any concurrent funding (e.g., from other grants or from your institution) or in-kind contributions (e.g., contributed faculty time) to further support this CPATH project?

○ Yes

○ No
○ Don't Know

If yes, please list sources, approximate amounts, and how these funds are allocated on the project.

24. If you have any additional comments you would like to make about your CPATH project, or about the CPATH program in general, please add them here.

You have reached the end of the survey!

Please review your answers before submitting the survey (you can move through the survey using the "<<Previous" and "Next>>" buttons), then hit submit to complete.

Submit your survey.

Thank you for completing this survey.