

Engineering Employee Survey

Consent Form

You are being asked to participate in a research project. Researchers are required to provide a consent form to inform you about the study, to convey that participation is voluntary, to inform you about your right to confidentiality, to explain risks and benefits of participation, and to empower you to make an informed decision. You should feel free to ask the researchers any questions you may have.

CPACE: A Collaborative Process to Align Computing Education with Engineering Workforce Needs

CPACE Research Director:

Dr. Mark Urban-Lurain

Director of Instructional Technology Research & Development

Division of Science and Mathematics Education

Michigan State University

111 N. Kedzie Lab

East Lansing, MI 48824

(517) 432-2152 x 119

(517) 432-5653 (fax)

urban@msu.edu

www.msu.edu/~urban

1. **PURPOSE OF RESEARCH:** You are being asked to participate in a research project that brings together Michigan State University (MSU), Lansing Community College (LCC) and Corporation for a Skilled Workforce (CSW) to design and implement a process to bring together a wide variety of stakeholders – business, community leaders and post secondary educators –to collaborate to identify workforce computational skills, define how these skills can be integrated across a curriculum, and develop revised curricula that integrate computational problem-solving across engineering departmental courses. This research is designed to document and evaluate this process to determine if it can serve as a model for national efforts to revitalize undergraduate computing education in engineering.

Your participation in this research will help us understand stakeholder's assessments of the computational skills needs in their business sectors. Your participation in this study will take about 20 minutes.

2. **WHAT YOU WILL DO:** You will complete a survey. The first part of the survey refers to general questions about your company. We will then ask questions about your skills and education and a final set of questions on your perceptions and opinions about the use of computational tools by engineers in your company. In particular, we are focusing using computers to analyze, design, model or make decisions as part of the engineering practice. For a number of the questions you are asked to think about your needs 3-5 years in the future. All information is collected, maintained, and analyzed confidentially.

3. **POTENTIAL BENEFITS:** If you wish, we will make results of the research available to you and these results may help you understand common themes that emerge from the research. The process developed in this project may contribute to revising engineering curricula that integrate computational problem-solving across engineering departmental courses. This process can serve as a model for national efforts to revitalize undergraduate computing education in engineering, and should be extensible to other computing education reform efforts. These efforts should help educators better prepare future engineering graduates.

4. **POTENTIAL RISKS:** A potential risk is that during the course of the survey the subject might reveal a trade secret. But please keep in mind that the protocol does not ask for proprietary information. You may refuse to answer any question that you feel may reveal proprietary or other confidential information.

5. **PRIVACY AND CONFIDENTIALITY:** The data for this project will be kept confidential. The survey conducted online, will be collected with some identifying information, such as your company and job title. The researchers will not collect IP addresses for those who complete the survey online. On all sources of data, your personal information will be replaced with pseudonym identifiers, such that your personal information will not be stored with any data. The list that connects personal information to pseudonyms will be stored in a separate secure location. Information about you will be kept confidential to the maximum extent allowable by law. It will not be possible to link the data with a particular participant.

Project data will be digitized and stored on a secure, password protected computing system at MSU Access is only granted to investigators on the project. Data will be stored for 5 years and then destroyed. The results of this study may be published or presented at professional meetings, but the identities of all research participants will remain confidential.

6. **YOUR RIGHTS TO PARTICIPATE:** Participation in this survey is completely voluntary. You have the right to say no. You may choose to stop participating at any time. Choosing not to participate or withdrawing from this study will have no affect on you in any way.

7. **COSTS AND COMPENSATION FOR BEING IN THE STUDY:** It is important to recognize that participation in this research study is in no way mandatory. You will not receive compensation for participating in this study.

8. **CONTACT INFORMATION FOR QUESTIONS AND CONCERNS:** If you have concerns or questions about this study, such as scientific issues, how to do any part of it, or to report an injury, please contact the CSPACE Research Director: Dr. Mark Urban-Lurain, Director of Instructional Technology Research & Development, Division of Science and Mathematics Education, MSU, at 517-432-2152 x 119, Fax: 517-432-5653, e-mail urban@msu.edu or regular mail at 111 N. Kedzie Lab, East Lansing, MI 48824

If you have any questions or concerns about your role and rights as a research participant, or would like to register a complaint about this study, you may

contact, anonymously if you wish, the Director of MSU's Human Research Protection Program, Dr. Peter Vasilenko, at 517-355-2180, Fax 517-432-4503, or e-mail irb@msu.edu or regular mail at 202 Olds Hall, MSU, East Lansing, MI 48824

1 Documentation of Informed Consent

Name
Company

2 Clicking "yes" below means that you voluntarily agree to participate in this research study. If you click "no" you will exit the survey.

Survey Page 1

Engineering Employee Survey

Demographics

3 Age (information collected for reporting purposes only, you may leave blank)

Age

4 Sex (information collected for reporting purposes only, you may leave blank)

- Male
 Female

5 Race/Ethnicity (data collected for reporting purposes only, you may leave blank)

- Asian
 American Indian/Alaskan Native
 Black/African-American
 Hispanic/Latino
 Native Hawaiian/Pacific Islander

- White
- More than one race
- Other, please specify

6 Employer Type

- Academic
- Government
- Private Sector

7 What industry is your firm part of? Please check any that apply.

- Aerospace
- Agriculture/foods
- Alternative energy
- Automotive
- Bio-based products
- Bio-medical
- Chemical
- Civil
- Computer hardware
- Computer software
- Construction
- Electrical
- Electronics, except computer
- Environmental
- Health and safety
- Industrial
- Marine/naval
- Mechanical
- Mining and geological
- Nuclear
- Petroleum
- Work environment
- Other, please specify

8 What is the title of your current position?

9 What is your job function?

- Design
- R&D
- Production/Manufacturing/Process
- Quality
- General
- Consultant
- Other, please specify

10 How long ago did you take your first engineering/ engineering technology job?

- less than 1 year
- 1 to 2 years
- 2 to 5 years
- 5 to 10 years
- 10 to 15 years
- 15 to 20 years
- more than 20 years

11 How long have you been employed in your current position?

- less than 1 year
- 1 to 2 years
- 2 to 5 years
- 5 to 10 years
- 10 to 15 years
- 15 to 20 years
- more than 20 years

12 What previous positions have you held with this company, if any?



13 What percentage of time do you currently spend using technology or computing skills?

- 0%-10%
- 10%-20%
- 20%-30%
- 30%-40%
- 40%-50%
- 50%-60%
- 60%-70%
- 70%-80%
- 80%-90%
- 90%-100%



Survey Page 2

Engineering Employee Survey

Skills and Education

14 What is your highest level of education?

- Associate degree in engineering technology
- Bachelor's degree in engineering
- Post Bachelor's study less than a Master's degree
- Master's degree

- Post-Masters study, less than PhD
- PhD
- Other, please specify

-
- 15** In what year and from what institution did you receive your highest degree? (Please spell out the name of the institution in full rather than using an acronym.)

Year

Institution

-
- 16** Thinking back to your first engineering/ engineering technician job after graduation, do you feel that your education adequately prepared you for that job?

YES NO

If no, why not?

-
- 17** What skills do you need today (if any) that were not part of the curriculum when you were in school?



Survey Page 3

Engineering Employee Survey

Technology

Please take a moment to think about the software your company uses to meet its key engineering challenges. In the following questions, we'll ask you to identify and describe up to 3 specific software programs that you consider "mission critical" to the performance of your job and your employer's business.

- 18** Please name your first piece of mission critical software (we'll refer to this as A in subsequent questions).

- 19** Please provide a brief description of mission critical software A, including what it's used for and why it's mission critical.



20 What percentage of your time do you spend using "mission critical" software program A?

- 0%-10%
- 10%-20%
- 20%-30%
- 30%-40%
- 40%-50%
- 50%-60%
- 60%-70%
- 70%-80%
- 80%-90%
- 90%-100%

21 Please name your second piece of mission critical software (we'll refer to this as B in subsequent questions).

22 Please provide a brief description of mission critical software B, including what it's used for and why it's mission critical.



23 What percentage of your time do you spend using "mission critical" software program B?

- 0%-10%
- 10%-20%
- 20%-30%
- 30%-40%
- 40%-50%
- 50%-60%
- 60%-70%
- 70%-80%
- 80%-90%
- 90%-100%

24 Please name your third piece of mission critical software (we'll refer to this as C in subsequent questions).

25 Please provide a brief description of mission critical software C, including what it's used for and why it's mission critical.



26 What percentage of your time do you spend using "mission critical" software program C?

- 0%-10%
- 10%-20%
- 20%-30%
- 30%-40%
- 40%-50%
- 50%-60%
- 60%-70%
- 70%-80%
- 80%-90%
- 90%-100%

27 How has using this mission critical software changed the nature of your engineering work?



- 28** For this study, we're particularly interested in computational skills, which we define as ability to use computers to analyze, design, model or make decisions as part of the engineering practice. What are the key computational skills you need to use the mission critical software you listed?

-
- 29** Where did you learn those skills? (select all that apply)

- in college for my engineering or engineering technology degree
- formal internal company training
- external training to which my company sent me
- picked them up on the job
- self-study
- Other, please specify

-
- 30** What are the pre-requisite skills that a new hire would need to use these mission critical programs/software you listed above?



Survey Page 4

Engineering Employee Survey

Future Software Directions

- 31** What are some specific examples of how new computational technology is changing your work?



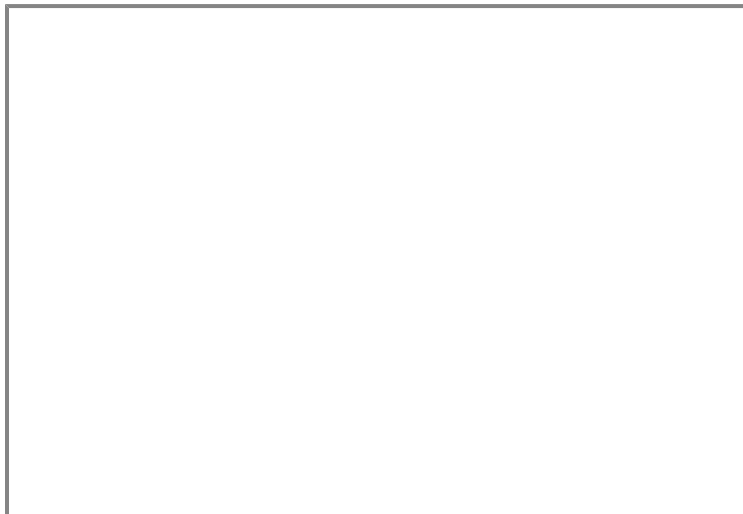
- 32** What new types of mission-critical software programs do you expect your company to adopt or develop in the next 3-5 years?



-
- 33** What do you see as some of the challenges in the implementation or integration of this software and new technology?



-
- 34** What new computational skills will be required to use those effectively?



- 35** What additional education and training do you envision you'll need for the future?

A blue arrow-shaped button pointing to the right with the word "SUBMIT" in white capital letters.

Survey Page 5

Engineering Employee Survey

- 36** Thank you for taking time to participate in this research project. If you are interested in receiving results from this research, please provide your name and email address below. We will store this information separately from your responses and only use your contact information to send you information about this research.

Name

Email

A blue arrow-shaped button pointing to the right with the word "SUBMIT" in white capital letters.

Survey Page 6

Engineering Employee Survey

Questions Related to this Pilot Survey

You are part of an initial group of engineers selected to help us refine this survey instrument to ensure that we are asking the right questions to get the answers we need. We greatly appreciate your answers to these last few questions regarding the survey itself.

37 How long did it take you to complete this survey?

- Less than 10 minutes
- 10 to 20 minutes
- 20 to 30 minutes
- 30 to 45 minutes
- More than 45 minutes

38 Were there any questions you found confusing or difficult to understand?

39 Are there any questions you think we should have asked, but didn't?



Thank you!



Survey Page 7
