



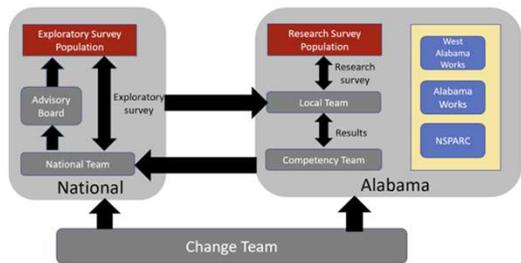
Motivation

- Widening gap between employer perception of lack of career readiness and academic preparation of computing graduates
- Even as employers continue to hire graduates, major employers (Amazon, Google, and Microsoft) have themselves entered the education space to offer credentials to replace undergraduate degrees
- The increased focus on competency-based education that focuses on approaches to assess candidates' skills and experiences
- Recent ACM/IEEE Computer Society's computing curricular guidelines also emphasize competencies

Mission Statement

To generate awareness and desire among faculty to improve their individual academic programs and to provide knowledge, ability and reinforcement to align their individual programs with generic academic program families that are competency-aligned with job families

Project Structure



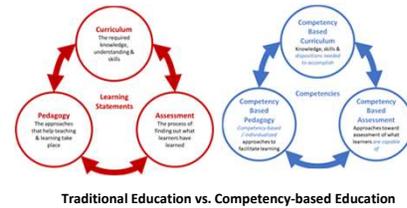
National Effort

- Engaged with computing faculty across the country to bring up interests and needs of a diverse set of employers
- Engaged with employers to create regular and useful feedback to inform curricular change efforts
- As of May 2022, have conducted workshops at the ACM SIGCSE Technical Symposium and other venues for over 150 faculty members

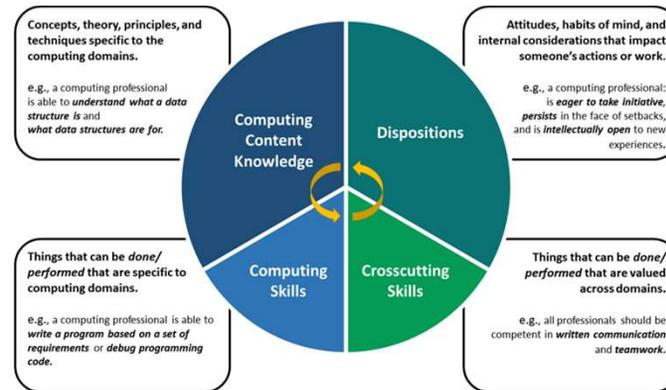
Modeling Competency

Competency: Expertise individuals can demonstrate in professional, educational, social, or other life contexts.

Competency-based education is built upon a competency-statement driven curriculum. Competency-based programs may use a variety of non-traditional pedagogical and assessment approaches.



Traditional Education vs. Competency-based Education



Research Activities

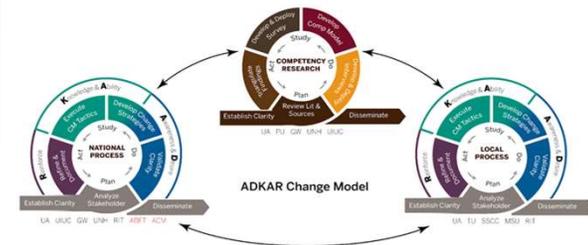
- Interviewed 31 managers and computing professionals and analyzed using constant comparative method for naturalistic inquiry
- Completed a systematic literature review involving 4949 from four major academic databases articles and selected 60 articles to analyze based on inclusion criteria
- Will create a research-based list of computing competencies

Alabama Pilot Institutions

- University of Alabama (R1), Tuskegee (HBCU), Shelton State (community college)
- Conducted curricula review and analysis
- Participated in workshops on team building, change model, and competency based education
- Connected with alumni and local industry to get feedback on project.

Effecting Change

- Awareness of the reason for the change (the why)
- Desire to engage and participate in change
- Knowledge about the change
- Ability to realize or implement change
- Reinforcement to ensure the change persists



Assessment

- Provided formative and summative feedback to various teams
- Documented asset building
- Assessed multi-institutional project team functioning
- Evaluated voice

Broader Impacts

- Align academic and employer communities to ensure computing graduates are better prepared for long-term industry careers
- Improve employment and labor participation rates within this job sector
- Evaluate alternative credentials to provide more and better access to jobs from a broader community that is not otherwise college bound, thus increasing diversity
- Develop the competency viewpoint in curricular design in computing to increase impact
- Develop new change management tools that can be adapted to effect change in other STEM programs

Publications To Date

1. R. K. Raj, M. Sabin, J. Impagliazzo, D. Bowers, M. Daniels, F. Hermans, N. Klesler, A. N. Kumar, B. MacKellar, R. McCauley, S. W. Nabi, and M. Oudshoorn. 2022. Professional Competencies in Computing Education: Pedagogies and Assessment. In 2021 ITICSE Working Group Reports (ITICSEWR '21), June 26-July 1, 2021, Virtual Event, Germany. ACM. DOI: 10.1145/3502870.3506570.
2. R. K. Raj, A. N. Kumar, M. Sabin, and J. Impagliazzo. 2022. Interpreting the ABET Computer Science Criteria Using Competencies. In the 53rd ACM Technical Symposium on Computer Science Education (SIGCSE 2022), March 2022, Providence, RI. DOI: 10.1145/3478431.3499293.
3. D. S. Bowers, M. Sabin, R. K. Raj, and J. Impagliazzo. 2022. Computing Competencies: CC2020 Dispositions versus SFIA Responsibility Characteristics. In 13th IEEE Global Engineering Education Conference (EDUCON 2022), Tunisia, March 2022.
4. D. Tagare, M. E. Exter, & I. Ashby. 2022.. Emergent Formative Roles in an Interdisciplinary, Multi-institutional Research Project: A Collaborative Autoethnography. Accepted to the Association for Educational Communications and Technology Summer Research Symposium