

Fostering Dispositions and Engaging Computing Educators

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ABSTRACT

Dispositions are cultivable behaviors desirable in the workplace. Examples of dispositions are being adaptable, meticulous, and self-directed. The eleven dispositions described in the CC2020 report should not be confused with the professional knowledge of computing topics, or with skills, including technical skills, along with cross-disciplinary skills such as critical thinking, problem-solving, teamwork, or communication. Dispositions, more inherent to human characteristics, identify personal qualities and behavioral patterns important for successful professional careers.

The leaders of this special session collaborate on a multi-institutional project funded by the National Science Foundation. Using their experiences at four higher education institutions, they will demonstrate how to foster dispositions among computing students through two hands-on activities. The audience will get first-hand experience using reflection exercises and vignettes, and will participate in debating their design, merits, and limitations. The resulting interaction will provide the audience ample time to discuss the benefits and challenges of incorporating and fostering dispositions in computing programs. It is hoped that participants will leave with concrete ideas on how to extend the current work to their own courses, programs, and institutions.

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1 OVERALL OBJECTIVE

Professional dispositions are *cultivable behaviors desirable in the workplace*, such as meticulousness and self-directedness. Their importance to the success of computing students has been highlighted by numerous recent curricular reports (e.g., [1, 2]) starting with IT2017 [5]. Yet, dispositions are not well understood by or familiar to computing educators, and neither are pedagogical approaches to foster them among students [4].

To address the need to incorporate dispositions within computing education, the session leaders have been collaborating, including on an ITiCSE 2021 working group report [4], an ITiCSE 2022 panel [3], and a multi-institutional project funded by the National Science Foundation. The project uses reflection exercises and vignettes that are coupled with course assignments to make dispositions salient and highlight their relevance in developing and achieving professional competencies.

The organization of the session, detailed in the following section, supports the three-fold objective of this special session:

- Increase awareness of the importance of dispositions for professional career success of computing graduates.
- Engage session's attendees in activities that illustrate two educational interventions designed to foster dispositions among students.
- Invite computing educators to join the session leaders in their ongoing project and evaluate dispositions in their own computing courses.

2 OUTLINE

The special session is organized in four segments. Table 1 shows each segment's duration and the session leaders facilitating segment presentations and activities. A significant portion of the session is dedicated to engaging the attendees in activities such as guided group discussions. Different forms of engagement will be used to ensure equitable participation of in-person and remote attendees (e.g., online questionnaires, chat questions, moderation of both participation modalities).

Table 1: Special session organization

Segment	Time	Facilitators
1 Project overview	10 min	Amruth Kumar
2 Reflection hands-on activity	20 min	Natalie Kiesler Bonnie MacKellar
3 Vignette hands-on activity	20 min	John Impagliazzo Rajendra K. Raj
4 Plenary discussion	25 min	Renée McCauley Mihaela Sabin

2.1 Project Overview

Kumar will start the session with a brief description of the project. His presentation will focus on the motivation and research objectives of the study; theoretical and practical basis for considering dispositions in computing education; two pedagogical approaches - reflection exercises and vignettes - designed to foster dispositions in students; and current status of the project.

2.2 Reflection – Hands-on Activity

Reflection exercises capture the behaviors students associate with the application of dispositions. Kiesler will give a short presentation on the purpose and structure of reflection exercises and how the analysis of data collected from these exercises contribute to the goals of the project. MacKellar will introduce a reflection activity in which the audience will participate. After the activity, she will facilitate a discussion to elicit audience feedback.

2.3 Vignette – Hands-on Activity

Vignettes illustrate exemplary application of dispositions by others. They are meant to help student engage in introspection on how the dispositions are relevant to their own lives. Impagliazzo will describe the use of vignettes in the project and how analysis of the data collected using vignettes will inform the project's activities. Raj will facilitate a vignette evaluation activity and a critical discussion about the merits and limitations of this pedagogical approach.

2.4 Plenary Discussion

The session will conclude with a plenary discussion facilitated by McCauley and Sabin. We expect the discussion to stimulate ideas, critiques, questions, concerns, and insights into what would help computing educators cultivate dispositions in their students.

3 EXPECTATIONS

The session is intended for computing educators interested in facilitating the development of competencies and dispositions in higher education. The session aims at the following learning objectives for its attendees:

- Recognize the importance of dispositions for students' success in their professional careers.
- Reflect on the benefits and challenges posed by fostering dispositions in computing via reflection exercises and vignettes.
- Analyze and discuss students' perception of dispositions, how they define them and try to apply them.
- Discuss and evaluate how students' perspective may deviate from experts' perspective.
- Familiarize themselves with the session leaders' current project on fostering dispositions and possibly collaborate with them or otherwise contribute to the project.

This highly interactive session will involve audience participation in activities and discussions. In return, the session leaders expect to develop a better understanding of the suitability and usability of reflection exercises and vignettes for fostering dispositions, and diverse perspectives on the challenges and opportunities for fostering dispositions among computing students. It is hoped that the shared understanding of dispositions generated by session's presentations and activities will inspire more widespread interest among computing educators to examine the cultivation of dispositions in their classrooms.

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