

The Behavioral Economics of Instructional Decision Making

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Abstract— Faculty members' decisions to alter teaching practices is often driven and restricted by both institutional and personal factors [1]. When examining these factors, faculty make judgments as a mechanism to evaluate the cost-benefit of enacting such a change. Behavioral economics concepts, such as satisficing, meliorating, path dependence, and bounded rationality [2], provide a lens to examine if and how faculty decide to alter a teaching practice or implement an evidence-based instructional practice. This special session engages participants in an agent-based simulation to examine faculty members' responses to stimuli that may affect their decision to change their instructional practices. The simulation will result in a model that can be used by faculty and instructional specialists to further analyze and support the use of evidence-based instructional practices.

Keywords — *behavioral economics; instructional practices; decision-making; innovation; teaching; evidence-based instruction*

I. GOALS AND OUTCOMES OF THE SESSION

In recent years, the engineering education community has focused on the adoption of evidence-based instructional practices [1,3-5] as an indication of closing the research-to-practice cycle [6,7]. To help facilitate this initiative, this session is designed to enhance faculty members' decision-making processes related to teaching strategies and the use of evidence-based instructional practices.

As a framework for the session, we will utilize behavioral economics concepts (satisficing, meliorating, path dependency, and bounded rationality [2]) in combination with agent-based simulations to engage and model how faculty members explicitly or implicitly conduct cost-benefit analyses regarding their teaching practices. This will provide an innovative perspective for faculty to think about their teaching practices and the decision making process. An example of how faculty may use behavioral economics in their decision-making is to consider a faculty member who is unsure about the best approach for course instruction. This faculty member may unknowingly apply the behavioral economic concept of bounded rationality by choosing to implement a teaching strategy because "that's how the department has always taught the course." Our workshop is intended to shed light on decision-making

considerations like these and support faculty members as they evaluate the factors that influence their instructional choices.

This session will result in a provisional model of how economic considerations influence faculty members' tendency to implement teaching strategies and the inter-relatedness of these economic considerations. This model can be used to develop more in-depth behavioral economic models as well as offer new explanations for faculty members' instructional choices and decision-making processes.

The attendees of the session will include both engineering faculty and professional development staff who seek to understand the decision-making processes of implementing (or changing) instructional practices. Participants, representing a broad demographic of faculty (e.g., years of experience, academic rank, teaching loads, and institutional context) and who regularly experience the opportunity to alter their teaching approach, will support the data that will be used to generate the provisional model. These faculty participants can include both faculty who are actively seeking to change their own teaching, those who are guiding their colleagues to make changes, and those who do not have an immediate desire to alter their practice. Additional participants may include teaching and learning instructional support specialists, who can benefit from observing and engaging with faculty participants about their decision-making process. A growing institutional change group within the engineering education community is researchers working on NSF WIDER grants [8]. These grants focus specifically on faculty adoption of evidence-based instructional practices and strategies for enhancing this adoption. This session can provide an additional perspective and strategy for talking to faculty that could aid these WIDER researchers. For all participants, agent-based simulations account for unique environments bounded by each participant's institutional and departmental context.

The expected outcomes from this session include increasing participants' awareness of and ability to apply behavioral economics concepts to their decision-making process in order to aid in the use of innovative and alternative teaching practices in the classroom.

II. JUSTIFICATION FOR NOVELTY

This special session will stimulate a discussion and reflection on instructional decision making grounded in behavioral economics. Integrating instructional decision making and behavioral economic will help faculty assess their current decisions regarding their practices in the classroom. Using participant-generated decisions from the session, facilitators will create a provisional model for how faculty make these decisions during the session, helping to frame additional conversations about innovative teaching practices both in the session and within the larger community. By utilizing the special session format, faculty will actively assess their decisions based on select behavioral economic considerations, discuss their process with other participants, and leave with a new perspective on their instructional decision-making process.

III. EXPLANATION OF INTERACTION EXPECTED FOR SESSION

An important influence on decisions/behavior is the accepted social norm of the context where the decision is made [2]. Therefore, this session will seek to create a social norm where alternative teaching decisions are strongly supported to help each participant become more comfortable exploring new practices. To encourage this community, participants will continually share ideas and experiences with the other participants and the facilitators. Each participant will have the opportunity to individually reflect on their personal practices, then collaborate with other participants to discuss the contextual and overarching influences that are common throughout the participants.

IV. DESCRIPTION OF SESSION CONTENT AND SESSION AGENDA

This session guides participants as they learn about behavioral economics concepts and how these concepts can apply to their decision-making process regarding teaching strategies. Behavioral economics can be defined as a subfield of economics “that studies how individuals and organizations make economic decisions” [9]. Importantly, the 2015 Edition of the Behavior Economics Guide (originally citing Koch et al., 2014; Lavecchia et al., 2014) states that behavioral-economic thinking has not been widely applied to educational contexts despite the potential benefits to teaching and learning [2]. Therefore, our session guides faculty members through a process to both learn about and apply behavioral economics when reflecting on their decision-making processes related to teaching preferences. Specifically, we will describe and use the following behavioral economics concepts [2] throughout our session:

satisficing - the minimum threshold for satisfactory performance (e.g., What do I need to do for my teaching to be "good enough?");

bounded rationality - choosing from a limited number of possible subsets (e.g., This is how we've always done it in my discipline, so why should I be different?);

meliorating - starting where you are, then just try to do better (e.g., I may not have fully implemented team-based learning, but at least I tried to implement some of it.)

path dependence - what's happening now depends on the past (e.g., This is the way I was taught, so that's the way I should teach it.)

V. SESSION AGENDA

The session will run according to the following prescribed timeline:

(00-05min) *Introduce Behavior Economics*. The session will begin with an overview of behavioral economics.

(05-10min) *Classify and Describe Teaching Goals*. To help participants situate their current practices within these concepts, each participant will then classify and describe their personal teaching goals and practices.

(10-20min) *Individual decision structure using Behavioral Economics*. Next, participants will individually illustrate their decision structure and their process for achieving their teaching goals, noting institutional and personal considerations and resources that directly affect their pathway to achieving the goal. The facilitators want the participants to express their decision making process as they see it. This may look like an algorithmic decision tree or a map from where their practices are now to where they want their practices in the future (or something else). The goal of this session element is to help the participants start thinking about their decision-making processes and the factors that influence that decision.

(20-30min) *Group Similar Pathways*. As a group, participants will develop a collective process to use for making an instructional decision. This process will be used during the session simulations as the group makes decisions about different instructional stimuli.

(30-70min) *Economic Simulation*. In the groups, participants will be given a scenario for implementing a new instructional practice. The groups will proceed using their process maps. At different intervals, behavioral economic stimuli will be inserted into the scenario, requiring groups to adapt and evolve their process map.

(70-80min) *Economic Modeling*. The groups will discuss how the stimuli influences the implementation and will quantify the impact using the behavioral economic concepts previously introduced.

(80-90min) *Summary and Reflection*. Using the results from this simulation, a model will be developed to explore the implications of stimuli and how they affect the ability to reach teaching goals.

VI. DISSEMINATION

Following the session, the facilitators will publish findings from this session that detail the usage of behavioral economics as a means to explore the factors that impact the implementation of teaching strategies and the model developed by the participants. The data collected and model generated during this session will help serve as a pilot exploration of this new scaffolded approach to encourage data driven conversations

about approaches to teaching within academic departments, colleges, and faculty development settings.

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