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### Understanding undergraduates' goal-setting at a regional zoo

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## **2019-2020 Assessment Mini Grant Project Report**

*Submit a brief (no more than 3 pages) report describing the project, its outcomes, and how the results were or will be used. Due to the Office of Assessment by June 30<sup>th</sup>, 2020.*

### **Project Title: Understanding undergraduates' goal-setting at a regional zoo**

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### **Study Rationale, Purpose, and Goals**

Most informal STEM learning research has focused on K-12 students, families, adults, or communities, with a concerning absence of studies conducted at the post-secondary level, particularly regarding motivation to learn science and goal-setting in informal learning settings. In an attempt to begin to address this lack of research, Co-PI Heim developed and administered a novel assessment, the Goal-Setting Assessment, to introductory and advanced UNC biology students in Fall 2018. The goal of this handout, which students completed immediately before and after an intervention at the Denver Zoo, was to understand what experiences undergraduates hope to engage in during an informal learning opportunity. Students responded to four open-ended, written-response items at the front of the zoo, prior to passing through the admission gates, as well as five open-ended written-response items at the end of their zoo trip, prior to returning to Greeley. The second set of questions addressed whether students felt that they had fulfilled the original goals they had set for the zoo trip (including learning, activity-based, affective, and social goals), and if not, why they had not attained those goals.

The purpose of the current study was to qualitatively describe what goals introductory and advanced biology students set for themselves during an intervention at a regional zoo, and to describe what types of goals (i.e., learning, activity-based, affective, and/or social goals) students were able to fulfill during this informal learning opportunity. Based on student responses on this assessment administered in Fall 2018, we aimed to refine the Goal-Setting Assessment, and give context to our initial findings. Specifically, we intended to refine this assessment so that the items were broad enough to be used both in (a) informal learning settings other than regional zoos, and (b) formal learning settings, so that instructors can better understand the goals of their students in particular courses or units of courses and make changes to the curriculum based on this knowledge. Our long-term goal was to understand the intrinsic and extrinsic factors that motivate students to participate in informal learning experiences in college, and how these relate to the goals and visitor agendas that students set for themselves when participating in informal learning opportunities. Our three short-term goals were to: (1) identify and describe what types of goals (i.e., learning, activity-based, affective, and/or social goals) students set for themselves during an informal learning experience, (2) identify and describe whether students attain

their initial goals after completion of an informal learning intervention, and (3) refine the Goal-Setting Assessment based on student interview responses. We *conducted interviews* with introductory and advanced biology students to accomplish these goals.

### **Project Outcomes**

Funds from the Assessment Program Mini-grant were used to support graduate and undergraduate time and equipment for the proposed phase of this project. Numerous products have resulted from this work:

- Thorough *literature review* which compiled previous work and informed our direction of study (with a primary focus on goal-setting in informal learning settings)
- *Rubric* to categorize student responses on the Goal-Setting Assessment
- *Coded Goal-Setting Assessment data* from students at UNC
- Preliminary *thematic analysis* of student responses on the Goal-Setting Assessment
- Original *set of questions or prompts* for student think-aloud interviews
- *Rubric* to categorize student think-aloud interview responses
- *Coded think-aloud interview data* from students at UNC
- Preliminary *analysis* of think-aloud interviews
- *Refinement* of the Goal-Setting Assessment
- *Will present findings* as a poster at the Teaching & Assessment Symposium in Fall 2020 (postponed from March 2020)

### **How Results Were Used**

Some of our more interesting findings from thematic analyses of student responses on the Goal-Setting Assessment were that (1) most students had learning goals linking zoo exhibits to course content or related to specific animal species, and (2) most students hoped to engage in passive interactions with animals at the zoo rather than direct interactions with people or animals. Further, (3) most students hoped to explore the zoo with friends, and (4) emotions or feelings that students sought to experience during the zoo trip were varied. Thematic analyses of our think-aloud interviews contributed to refinement of the Goal-Setting Assessment. We hoped to develop clearer and less redundant items for the GSA, and also aimed to develop items that could be used in both an informal setting and formal classroom setting. In the think-aloud interviews, we probed 10 students about why certain items on the Goal-Setting Assessment might be invalid or difficult to interpret, and/or how to make these items more broadly applicable to both informal and formal learning settings. The refined Goal-Setting Assessment is intended to serve as a tool to assess undergraduate goal-setting and visitor agenda development at a broad range of informal learning settings, and will hopefully be applicable to goal-setting in the formal classroom as well.

### **Key Findings from Our Study**

#### ***What did thematic analysis of Goal-Setting Assessment responses tell us?***

- Most students identified zoo exhibits linked to course content and animals as primary topics or themes they intended to learn about during their zoo trip.
- Most students identified passive interactions with animals as activities they hoped to engage in during their trip.

- Students cited a variety of emotions and feelings they hoped to experience on the zoo trip, including happiness, enjoyment, fun, interest, intellect, and excitement, among others.
- Most students cited friends, UNC staff, and zoo staff as people they hoped to interact with during the zoo trip.
- Students in a free-choice learning group achieved their learning and activity goals more often than students in a structured learning group.
- Students cited a range of external and internal factors that prevented them from accomplishing learning and activity goals at the zoo, though this encompassed a minority of participating students.

***What did thematic analysis of think-aloud interview responses tell us?***

- Most students found the open-response format of the GSA effective, though many students mentioned that listing some examples or possible choices under each item might make goal-setting at a novel setting like a zoo or museum more focused.
- Most students believed items on the GSA could easily be applied to the formal classroom with some minor edits (e.g., changing “zoo” to “course,” asking about what topics students want to learn about in a particular course, etc.).

***What implications can we draw from this study?***

- We suggest that undergraduates who have the opportunity to develop learning goals that better align with their intrinsic interests may be more likely to engage in self-regulated learning and develop or maintain intrinsic motivation within the sciences, which could ultimately lead to improved retention among undergraduates in science college programs.