

Public Abstract

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Graduation Term:FS 2012

Department:Learning, Teaching and Curriculum

Degree:PhD

Title:ASSESSING ASSESSMENT: HOW USE OF THE CONCEPT INVENTORY OF NATURAL SELECTION INFLUENCES THE INSTRUCTIONAL PRACTICES OF AN EXPERIENCED BIOLOGY PROFESSOR AND SUPPLEMENTAL INSTRUCTION LEADER

Assessment has garnered increased interest in recent years. It is seen as critical to enhancing student learning and understanding. Formative assessment tools such as concept inventories could be valuable in moving toward such goals. Concept inventories, a recent addition to biology education, hold much promise for helping faculty to understand the preconceptions their students hold and therefore, how to design lessons to better support conceptual change processes of students. While these are the hopes of the developers of concept inventories, no one has examined what professors and other academic professionals actually do with results of the concept inventories.

Likewise, academic support programs such as Supplemental Instruction have gained attention as mechanisms by which to help students improve understanding and increase achievement. Much research has touted the efficacy of Supplemental Instruction programs. However, little research has examined the mechanisms by which those learning gains are attained.

Do innovations such as concept inventories help improve teaching and learning? How are they used and what can we learn from the experiences of faculty and academic support professionals who use them? Would learning improve if concept inventories were utilized in an academic support environment such as Supplemental Instruction?

This study used interviews with an experienced biology professor and an experienced Supplemental Instruction Leader to examine how they used the collective results of the Concept Inventory of Natural Selection (used as a pre- and post-test) to design and implement lessons in a large lecture introductory biology course and in Supplemental Instruction sessions. Using observations and document analysis as supporting data, themes were identified that describe the views of learning, knowledge of assessment principles, and knowledge of assessment interpretation and action taking of participating educators. This study provides the first data for how concept inventories are interpreted by faculty and Supplemental Instruction Leaders and used to guide instructional planning and implementation.

Data analysis revealed that an experienced biology professor did not rely on the diagnostic pre-assessment tool (the CINS) to understand and act upon prior knowledge and misconceptions of students. Rather, she was already aware of common student misconceptions and prepared to help students modify their knowledge. Instead, she preferred to rely on such instruments as a tool to help students self-assess the status of their knowledge. Likewise, this experienced Supplemental Instruction Leader was also aware of misconceptions of students and prepared to work with them to revise their understandings prior to receiving the results of the CINS pre-assessment. She relied on a variety of formative assessment tasks to help students build their knowledge and periodically check their understandings in a collaborative, small group environment.

This study sheds light on areas of strength as well as needed professional development and education for faculty members and Supplemental Instruction Leaders. It provides the first data on how concept

inventories may be used in the biology classroom and in Supplemental Instruction sessions. It also identifies areas of educator knowledge where more understanding and research is greatly needed by the teacher educator community.