



### We're For Strategic Planning

## Goal Two:

### Advance Experiential Learning

**Initiative:** 2 **Initiative Name:** Applying the Science of Learning to the Learning of Science

#### *Introduction*

SENCER stands for Science Education for New Civic Engagements and Responsibilities. It incorporates experiential learning and community engagement to teach the STEM disciplines (Science, Technology, Engineering and Mathematics) in a hands-on and practical way that helps the community. We teach through important civic issues to engage the students in real-world problems and to demonstrate the importance of what the students are learning. Besides the focus on STEM fields, SENCER is also very interdisciplinary and involves all majors on campus. We hope that by engaging the students in more meaningful learning experience that effect real-world problems that students will realize the potential of their education.

#### *Purpose*

The main purpose of the SENCER program is to engage students in STEM education, make them appreciate these fields, and ultimately to increase majors in the STEM disciplines which is a national need. We don't simply teach in a new fashion, but we study the impact on student learning, improvement in 21st Century Skills (such as critical thinking), and attitudes towards science. We have found the SENCER classes to be very engaging for students and to be a better way to teach as a whole. The students have responded well to our assessments (specifically the Student Assessment of Learning Gains). We plan for this teaching model to take hold at ISU and spread throughout its departments, which will enhance experiential learning and community engagement in the entire curriculum. To that end we are conducting professional development workshops for foundational studies with the hope that more foundational studies courses in the future will be SENCER courses.

#### *Methods*

Our main means of dissemination is through professional development workshops and presentations of which we have given over 30. We will continue to hold these workshops and make personal contacts on campus to promote the SENCER Teaching Model. We have published an international peer-reviewed article on the assessment of our first two years of using the SENCER Teaching Model in our ENVI 110: Introduction to Environmental Science course. This assessment supports that students appreciate the experience that they receive in these classes.



#### *Discussion*

The results from the Student Success charts clearly support that students registering in SENCER courses demonstrated higher rates of retention. These rates are impressive for Freshmen students: from those taking a SENCER course in their freshman year, 78.4% (+14.1%) returned to ISU for their sophomore year. Freshmen with no SENCER course experiences demonstrated a much lower retention rate: only 64.3% of these students returned to ISU for their sophomore year. It is quite probable that registering for SENCER courses is a strong indicator of a positive class experience, and influences students' decision to return for their sophomore year in ISU.

The same pattern is observed for sophomores, juniors and seniors. Students registering in SENCER courses demonstrated higher retention rates than students with no SENCER class experience:

- (a) 86.9% vs. 81.7% (+5.2%) for sophomores
- (b) 92.3% vs. 86.5% (+5.8%) for juniors
- (c) 90.6% vs. 86.7% (+3.9%) for seniors

Data also indicates that the ISU- SENCER team needs to focus in SENCERizing more Foundational Studies courses, especially those courses that students take during their first two semesters in Indiana State University. SENCER experiences during the senior year, although significant (+3.9%), do not have the same impact in student retention as those in the early years of the students' academic life

#### *Summary*

Our SENCER program at ISU has only been active for six years with funds from the strategic plan, compared to the 13 years that SENCER has been active as a national program. In our short time with this teaching model, we have identified more than 35 SENCER-like courses on campus and provided thousands of field experiences for majors and non-majors. We have also been recognized with a national award for our contributions to Citizen Science. Our model of the SENCER Student Leadership Team was unique in the nation and is now being adopted by other universities. This particular contribution was made possible by the funds from this strategic plan. Our goal for the coming year is to expand this program to departments from all ISU Colleges, and to work to have more Foundational Studies classes using the SENCER Teaching Model.

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