College of Saint Mary
Rule 24 Section 3:
Use of Related Data and Information for
Continuous Program Improvement of Endorsement Program

Endorsement Program: Biology 7-12

What did the data indicate and what endorsement program changes were made as a result of assessment data analysis?

There were fewer than five completers for the Biology endorsement program during the years reported; to ensure candidate privacy, data is not provided.

Biology Secondary Education students major in biology with a minor in education; therefore, changes relating to biology majors pertain to them as well. In the last seven years the program has made changes and improvements in course offerings, opportunities, and infrastructure. Courses added include a First Year Seminar focusing on plant pathology and food security, 200-level personal nutrition, 200-level ecology, 200-level entomology, 300-level anatomy and physiology, 400-level intermediate physiology, 400-level gross anatomy, and a 100-400-level seminar series (scientific method, scientific literacy, and scientific communication). Equipment and instrumentation have been added as well as increased student opportunities to participate in research and internships. The program has purchased an environmental chamber, biosafety cabinet, additional microscopes, Vernier equipment, an anatomage table, and a variety of molecular biology instruments. Currently, the university has a one-bed cadaver lab and is in the process of building an eight-bed cadaver lab. The university built a 500 gallon fresh water aquarium that holds native Nebraska fish, and is in the process of building a 100 gallon aquaponics system to serve as a nursery for the aquarium. Preexisting courses have been modified to increase students' experiential learning (e.g., inquiry-based activities in cell biology and botany, field research in zoology).

Faculty changes include the addition of a forensically-trained entomologist, a molecular biology/microbiologist, and a parasitologist/anatomist. Faculty are developing individual research projects that will give students opportunities to engage in authentic disciplinary research. There are many opportunities for students to be involved professionally in the discipline. The INBRE (IDeA Networks of Biomedical Research Excellence) program, funded by NIH (National Institutes of Health), supports up to four students per year to do disciplinary research, first at a research institution, and then at their home institutions. An NSF (National Science Foundation) grant provides assistantship money for students engaging in research on campus. Students have also pursued a variety of internships at Henry Doorly Zoo, University of Nebraska Medical Center, and regional veterinary and dental practices.

NASA Nebraska has funded students to do biology research and to participate in an elementary science outreach program, bringing STEM activities to area schools. The main objective of the Elementary Science Outreach Program is to provide as many elementary school students as possible with hands-on

enriching science activities and to involve CSM undergraduate volunteers in the delivery of the activities. This year 33 students from Biology, Human Biology, and Education volunteered to visit 13 local elementary schools. As of now, they have made 31 different classroom visits. The elementary school teachers choose which activity he/she wants the students to teach and the top three this academic year were "States of Matter," "Properties of Water," and "Ecosystems." The total number of elementary school students impacted was 1,113, with the largest group falling in first grade at 390 students. That is a 200+ increase in students from last year.

As an extension of the Elementary Science Outreach Program, CSM has initiated a Teachers' Science Workshop for area elementary teachers who want to develop their expertise in teaching elementary school science. This year 19 K-6 teachers completed the program. Two CSM science faculty prepare background information and activities that the teachers take back to their classrooms, and an education faculty member leads the pedagogy training.

Communication between biology and education faculty has increased over the past three years and interactions will be facilitated under a new organizational structure. The biology program director met with education advisers to explain the content and appropriateness of various biology courses for education majors. This conversation helped education faculty direct their advisees to courses that would most effectively prepare them for the classroom, and it helped the biology program director make scheduling decisions to meet students' needs.

What future changes are planned?

Going forward a new organizational structure will be implemented in which the Division of Professional Studies (includes education program) and Division of Arts and Sciences (includes biology program) will be combined into one division overseen by an associate dean. Consequently, faculty from these previously independent groups will meet together monthly for division meetings. The additional interaction will foster conversations between faculty, thereby increasing understanding programmatic needs and facilitating collaboration between programs. Additionally, new Biology faculty added in fall 2016 will enhance the offerings and research opportunities afforded to students majoring in Biology at College of Saint Mary.

What are implications for overall unit improvement initiatives to the endorsement program?

Several programmatic changes in the Unit have had an impact on the endorsement program.

- These include use of the statewide Clinical Practice evaluation format, updated CSM Student Outcomes, the Case Study project requirement and changes in Praxis II requirements.

- The use of the statewide NDE Clinical Practice Evaluation had impact upon this endorsement program. The evaluation is built on InTASC Model Core Teaching Standards. The CSM Student Outcomes have been aligned with the InTASC standards.

- The Case Study project was developed to provide an authentic assessment tool in addition to the clinical evaluation. This additional tool provides opportunity to use multiple measures of student performance in assessing, planning, implementing and evaluating students. Students complete the case study during Clinical Practice.

- The standard lesson plan template used by the program for many years was revised to two formats: a Lesson Plan with Analysis and Lesson Plan with Reflection. It was developed in fall 2013 to be used across methods courses program-wide when students are able to plan, implement and evaluate lessons in field experience settings. There have been limited opportunities for students to conduct lessons that allow for collection of data and detailed analyses. This has resulted from restricted opportunities for students to take leading roles in classroom instruction due to reluctance of classroom teachers to relinquish responsibility to students, because of the pressures of testing. The unit plans to solicit partnerships with specific schools and classrooms to allow students to complete at least one detailed Lesson Plan with Analysis as part of their preparation.

- The requirement that all teacher education students must pass the Praxis II content exam for certification has had an impact on the Teacher Education program. Teacher Preparation faculty have collaborated with content area faculty to ensure that course content is consistent with the content of the exam.

- Teacher Preparation Faculty keep directors of secondary content areas informed of changes in endorsement requirements. Decisions will be made in collaboration between the content area program director and Teacher Preparation Faculty. Shared advising of students by content program faculty and Teacher Preparation Faculty ensures that students complete all requirements for both programs.

- There has been continual work on dispositional reflection by all individual Teacher Education candidates as well as faculty input on dispositions from across the coursework prior to clinical practice.

- Short and long form field experience evaluations have been adopted. The long form evaluation reflects standards used in the NDE Clinical Practice evaluation and also addresses professional characteristics/dispositions.

- The Clinical Practice application was updated and now includes disposition reflection and assessment of strengths and weakness in dispositional areas.