Reflective Assessment and the Program Review Process

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Outline

- Reflective Assessment
- Guidelines for Program Review
- Mathematics at LCSC
- Proposal for Program Review
- Recommendations
- Where We Are Now
- Next Steps
Reflective Assessment

“Assessment is an ongoing activity that leads to improvement in student learning by providing data necessary for making informed decisions at the class, course, and program level.”

Beyond Crossroads, Chapter 5
Figure 2: The Assessment Implementation Cycle

1. Define/Refine student learning outcomes based on input from stakeholders.

2. Design assessment tools, criteria, and standards directly linked to each outcome.

3. Implement assessment tool(s) to gather evidence of student learning.

4. Analyze and evaluate the collected data.

5. Identify gaps between desired and actual results.

6. Document results and outline needed changes in curriculum, instructional materials, or teaching strategies.
Guidelines: AMATYC

“Faculty should develop a consensus about the essential student learning outcomes for mathematics courses and programs, as well as the college’s quantitative literacy general education outcomes.”

Beyond Crossroads, Chapter 5
Guidelines: AMATYC

- Three components:
  - Assessment of mathematics programs
  - Assessment of other academic programs that include mathematics learning outcomes
  - Assessment of the mathematics component of the college’s general education outcomes.
Guidelines: MAA/CUPM

Mathematical sciences departments should understand student backgrounds and needs, determine if department programs serve student needs, and strengthen alignment and assess effectiveness.

CUPM 2004
Guidelines: MAA/CUPM

Program reviews should assess

- general education or introductory mathematics courses
- courses for students majoring in partner disciplines
- courses for students majoring in the mathematical sciences
- courses for mathematical science majors with specific career goals
Guidelines: MAA/ CUPM

What should departments change so that future students will learn more and understand it better?
Guidelines: NWCCU

**Standard 2B.** Educational program planning is based on regular and continuous assessment of programs in light of the needs of other disciplines, the fields or occupations for which programs prepare students, and other constituencies of the institution.
Guidelines: NWCCU

**Standard 2.B.2.** The institution identifies and publishes the expected learning outcomes for each of its degree and certificate programs. Through regular and systematic assessment, it demonstrates that students who complete their programs, no matter where or how they are offered, have achieved these outcomes.
Guidelines: NWCCU

Standard 2.B.3. The institution provides evidence that its assessment activities lead to the improvement of teaching and learning.
Guidelines: NWCCU

- What evidence is there that the skills improved or declined as a result of the program?
- How are these judgments rendered?
- Does the improvement appear permanent or transitory?
- **How has the program been changed as a result of the assessment program?**
Lewis-Clark State College

- 3500 students
- Emphasis on nursing, business, teaching, social work.
- Community college function – over 60% of new freshmen place into developmental mathematics.
Guidelines: LCSC

- Major program review is one mechanism to provide continual improvement of institutional delivery of services including teaching and learning.
- The results will augment other information used for strategic planning, program development, and budgeting decisions at the institutional level.
Guidelines: LCSC

- **Elements of program review**
  - Program self-study
  - Academic Dean report
  - External Reviewer report
  - Internal Reviewer report
  - Academic Dean summary
  - Provost response
Guidelines: LCSC

Self-Study

- Narrative portion $\leq$ 10 pages.
- How well is the program meeting the goals and objectives of the institution?
- Is the program in compliance with the accreditation guidelines of NWCCU?
Guidelines: LCSC

- How well is the program meeting the goals and objectives published for the program?
- How effective and efficient is the program?
- How does the program compare with programs at similar institutions?
Guidelines: LCSC

Required Documents.

- Unit mission statement and strategic plan.
- Annual program review summaries.
- Faculty/staff curriculum vitae.
- Student learning outcomes, means of assessing outcomes, and program changes based on assessment of outcomes.
General Education Goals

Mathematics Component
To understand mathematics and quantitative methods as logical constructs and employ this understanding to solve problems and manipulate associated abstract symbols.
General Education Goals

Courses which fulfill this requirement will introduce students to the axiomatic nature of mathematics, ensure a minimum level of algebraic competency, help students understand how mathematics both reflects and models the observable world, give students the ability to generalize these ideas and modify them to solve quantitative problems in a changing world.
Mathematics at LCSC

- 3 tenured PhD mathematicians
- 6 non-tenure track Lecturers with only teaching responsibilities.
- 1 long-term (20 yrs) adjunct, former h.s. teacher, teaching Math for El. Ed.
- 2 adjuncts, working on PhD dissertations.
“Core” Mathematics at LCSC

• Same textbook, no common finals, syllabi, or objectives, informal discussions about topics/pace.
  ◦ Finite Math (4 cr); Finite A/Finite B
  ◦ Pre-calc (5 cr)
  ◦ College Alg (3 cr) + Trig (2 cr)
  ◦ Algebra and Trig with Applications (4 cr)
  ◦ Calculus (5 cr)
  ◦ Mathematics for El. Education (6 cr)
“Core” Mathematics at LCSC

- Course assessment is at discretion of instructor.
- Use of course assessment is at discretion of instructor.
- Gen. Ed Core Goals assessed by College BASE test
- Faculty do not currently receive results of College BASE test.
Developmental Math at LCSC

- Same textbook, common objectives, common final exams with group grading, common mastery skill quizzes.
- Faculty meetings every six weeks.
  - Prealgebra (3 cr)
  - Basic Algebra (3 cr)
  - Basic Algebra A / Basic Algebra B (4 cr)
  - Intermediate Algebra (4 cr)
LCSC: Informal Discussions

How can we use the program review

- to convince the administration that we absolutely need another tenure track faculty member?
- to better ensure consistent expectations across sections?
- to move away from teaching “to the textbook” and instead use the textbook to support identified course objectives?
LCSC: Informal Discussions

How can we use the program review

- to help faculty come to consensus on appropriate use of technology?
- to improve “downstream” success rates?
- to support the development of a new gen. ed. course?
- to improve our math for el. ed. course?
Self Study Proposal

- With Division Chair and Accreditation pressure, lead faculty member received 3 credits of release time.
- Lead Faculty sends e-mail with CUPM Sample Questions to faculty.
- Short meeting to discuss these and identify other questions.
- Proposal for Self Study sent to micromanaging dean. Finally approved.
Self Study Questions

Who is taking our courses?

- What are the intended majors of the students enrolled in our courses?
- When do students begin taking mathematics?
- When do students complete the math portion of the Gen. Ed curriculum?
Self Study Questions

• Are we using the right curriculum?
  ◦ Does every gen. ed. and service course have examinations or assignments that affect a student’s grade requiring students to explain their reasoning, solve multi-step problems, generalize from examples, solve a problem two different ways, read new material and use it in some way, and use a mathematical tool to solve a problem in another discipline?
Self Study Questions

- Are we using the right curriculum?
  - Does the syllabus of every gen. ed. course we offer include an application to at least one discipline outside mathematics that is less than 50 years old?
  - Are there other niche courses that we could feasibly offer that combine the service and gen. ed. role for majors other than el. ed. and radiography?
Self Study Questions

• Is our curriculum internally and externally consistent?
  ◦ Do students follow the prerequisite/successor pathways in a streamlined and timely fashion?
  ◦ Are successful students also successful in their next course?
  ◦ Are our prerequisites sound and effective?
  ◦ Do the answers to the previous two questions change with lapsed time or by semester?
Self Study Questions

• Is our curriculum consistent?
  ◦ Do we make effective use of advising, placement tests and/or consultation with colleagues in other disciplines to ensure that students take appropriate introductory courses?
  ◦ Do the syllabi of sequential courses make sense together? Do the objectives flow logically?
Self Study Questions

- **Is our curriculum consistent?**
  - How does the content of developmental and gen. ed. courses compare to our sister institutions in Idaho and to our major “trade partners” in other states?
  - Do we talk with the faculty from other disciplines our courses, new courses, applications, or team-teaching/guest lecturing?
Self Study Questions

• Is our curriculum consistent?
  ◦ Can we see progress in our majors’ abilities to reason, solve problems, think abstractly, read and write mathematics, and present their ideas orally as they move through our program? How do we gauge their progress?
  ◦ Are math courses a barrier to graduation?
  ◦ How do students perform in their other courses as compared to their math courses?
Self Study Dean/Provost Questions

- 5-yr overview of frequency of math course offerings with 10th-day enrollment, directed studies, program requirements.
- Budget for last 5 years of adjunct funding by category.
- How are developmental math programs best administered?
Self Study: Data Collection

- Raw data request to Office of Institutional Assessment.
- 5 years of enrolled students in math classes and their grades.
- Program information of student (major/minor)
- Credits completed when taking course
- Grades for all classes enrolled in when taking math course.
Self-Study Report

- The report which includes the responses to these questions is available in PDF format at www.lcsc.edu/edmiller

- The importance of “downstream” success rates.
Recommendations: Assessment

- A1: Continue College BASE test to assess Gen Ed core curriculum.
- A2: Implement common assessment in developmental, general education and key service courses.
Recommendations: Curriculum

- **C1**: Prototype syllabi for each course including catalog descriptions, goals and objectives, mandatory or suggested grading schema, current or recent textbooks with required coverage
- **C2**: Review of catalog descriptions.
Recommendations: Curriculum

- **C3**: Add courses in Euclidean geometry (2xx) and elementary linear algebra/matrix theory (2xx) to support teacher education and engineering.
- **C4**: Explore feasibility of developing and offering gen ed. courses for targeted populations.
- **C5**: Review list of elective mathematics courses.
Recommendations:
Curriculum

- C6: Change requirements in the math major. Require a second semester of abstract algebra or real analysis. Delete language requirement.
- C7, C8: Change requirements in the math minor and in the math minor for elementary teaching.
- C9: Delete Applied Calculus course.
Recommendations: Resources

- R1: Create a new tenure track faculty line to take a leadership role in the preparation of prospective elementary and secondary teachers.
Where We Are Now

- Program review to division chair.
- Identifying internal/external reviewers.
- Faculty assigned to write common finals.
- Piloting of common finals and group grading in December.
- E-mail discussion of technology use; this will be an issue for final exams.
- Curriculum changes sent to curriculum committee.
Reflective Assessment

**Figure 2** The Assessment Implementation Cycle

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6. **Document** results and outline needed changes in curriculum, instructional materials, or teaching strategies.
Next Steps

- Reflection on external and internal reviewer recommendations.
- Write course objectives.
- Develop new gen. ed. core class targeted at low success populations.
- Develop lab component for el. ed. course.
- Align final exams and objectives.
- Item analysis of final exams.
Next Steps

- Continue informal discussions with other faculty in partner disciplines, especially engineering and computer science.
- Continue to build case for new faculty despite probably budget cuts and hiring freeze.
- Think about assessing performance in mathematics in partner disciplines.
Next Steps

- Determine how we will react to and use further assessment information at course and program level, including College BASE test. This is a critical step to be completed before accreditors arrive on campus in October.
Faculty Reaction

- Frustration with workload.
- Too soon to tell – group grading of finals is going to be a shock for some.
Questions?

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