Undergraduate Biology – BS

1. Essence statement. The undergraduate biology program provides individuals with a high-value education in biology, including research opportunities and interaction with internationally renowned experts in the field.

Background/ideas: Educate a citizen who can engage in a conversation about the biological sciences with the public. Prepare students for lifelong learning and productivity in the biological sciences. Create a student with solid basic education that can go anywhere. Undergraduate research. Good value with research. Collaboration with WSU. More personal advising/ teaching/care. Medium size so experts, but small enough for prof/student interaction. Personal relates get retention.

Focus issue – program really develops students for advanced degrees. Job market)and geography) minimize options BS biology majors to get an interesting job.

Assessmt:
4 values – cost/value, interaction, research, experts (strengths)
Improvemt: resonate with any stakeholder – high-value education works somewhat, but what about faculty? Change language to capture interest and passion of all stakeholders. Action plan: individuals to "people with enriched/high-value. Add words about going out to community."

2. Stakeholders

Students, Majors (degree and quality of education)
Students, nonmajors (quality of education, meet requirement)
Citizens of State/taxpayers (value for tax money for education, competitive in local and greater job market, widespread positive reputation – ex. Cloning mules)
Parents: good education, employable, socially successful kids
Biology Faculty & Staff: pride/accomplishment (inside and outside school), reputation, quality education, have quality students around who can contribute to research/keep it vital
Other departments (service programs): offer good programs that meet needs of their majors, and weed out students.
University of Idaho administration: graduation/retention, quality, manage resources
Public Employers: highly trained, critical thinking, enthusiastic students
Graduate programs: good graduates/knowledgable/motivated
Professional health programs: good graduates/knowledgable/motivated
Private companies: highly trained, critical thinking, enthusiastic students
Govt organizations/employers: highly trained, critical thinking, enthusiastic students
Alumni: pride
Granting agencies: meet goals of the grants; good training; peripheral interests (labs, international renown)
SBOE: governing body. Impact finances. Quality for budget.

Who complains/asks help/congratulates/would notice if program went away.

3. Scope

Ideas:

Who are we,…

Provide a very solid foundation in the biological sciences. Graduates can go anywhere and succeed.

Department at mid-sized university. Thus, students not a number, but expertise not spread too thinly. Not too large to care.

Undergraduates engage in research to help generate new knowledge, thus strengthening their application of the knowledge, becoming aware of problems, making breakthroughs, learning the scientific process, learning limitations, interacting with experts, getting a taste of whether they want to do research. Creates stronger resume.

Professional schools (med, vet) require research for the critical thinking skills and experience. Looking for motivation and some appreciation for what is involved in generating primary knowledge.

Interact with WSU. Taking advantage of geographical proximity to offer more to the students. Cross-listed courses. Opportunities exist to interact with researchers at WSU.

Interaction with graduate students: mentoring, more accessible than prof (emotional). Different interaction than with faculty member.

Education methods:

Service Courses: Provide basic courses for core and other majors. All levels – lower and upper division – meet requirements for other majors.

Who we are not,…

Exhaustive catalog of specializations in biology. (resource limitation)

Gray area: students would want more electives, taxpayers would need restraints, SBOE would want…

4. Top 5 goals. – leaving it not prioritized, not narrowed down.

Current:

a. Educate them – high quality. The critical thinking component may go here.
b. Recruit, Retain and graduate in a reasonable time frame
c. Get motivated/interested undergrads into a research environment
d. Show that using resources/budget well
e. Provide faculty members with opportunity for satisfaction. TIME. Recognition.
f. Faculty treated with respect and valued for what doing in classroom.
g. Faculty treated fairly. Not given unreasonable teaching assignments.
h. Employability/prep for professional programs.

i. Enhance undergraduate research and ta experiences.

Future:

a. Expand programs/mechanism is budget. Use efficiency of current program.
b. Improve program – better student/teacher ratio in beginning programs (more resources into beginning courses)
c. Competitive entry to courses (higher entry standards)
d. Upper division resources
e. Recover classes/labs through exchange program.
f. Fair salaries.
g. Enhance undergraduate research and ta experiences.

5. products/assets

a. Graduates who have been accepted to competitive graduate or professional health programs or obtained jobs.
b. WSU – cooperative work/classes
c. Research active faculty – provide environments for undergrads
d. Fair teaching loads
e. Collegiality/environment
f. Students – finishers are motivated.

6. Processes/systems/structures

a. Undergrad research program
    a. Students approach faculty members. Get into a lab. Submit their own proposal.
    b. Grant writing/donors specifically for undergrads.
    c. Future: ask for additional donations.
    d. Use a seminar series/inform the students.
    e. Encourage faculty members to talk to inclined students. (another level of advertisement.)
    f. Students produce a presentation or poster when done.
b. Mentoring
c. Cooperative program with WSU
    a. Current: routinely correspond and communicate needs wrt classes and seminars. Students can work with directed studies to take classes.
    b. Future: increase cooperation/communication to expand cross-listed/cooperative offerings.
    c. Possibility: coordinate whole clusters of classes? Geology has a model for this. Look at other programs to develop greater utilization of this resource.
d. Educational methods – how classes are operated.
    a. Greater support for TA.

b. Lab coordinator? Training?
c. Research grants for teaching. Highlight efficient use of current funds with promise of continued efficiency, including with new funds.
d. Current: grad and undergrad tas alike receive training.

e. recruiting –
   a. recruiting & retainment is primarily through excellent faculty (internal to campus).
   b. Undergrad visits to high schools or outreach. Reinstitute student visits. A money issue. "wine and dine."
      i. Bring better students to campus
      ii. Increase entrance standards.

Break/large group discussion:

What learned so far?

1. Process recursive. Work on a step, go back, improve.
2. Difficult. Requires transforming culture.
3. Future goals are outgrowth of current. Consider using a table. (Connects operational and strategic planning. Current and future should be linked.)
4. Pay attn to the details of the process. Learn about the process.
5. Successful assessment doesn't have to be as complicated as we think. As clarify thinking and process and what doing, assessment becomes easier. Also, other experiences may have suggested not a doable thing.
6. Requires a lot of time. Large time investment. This can be argued as a learning curve issue. Once you know what you are doing, it gets a lot faster. Development process. Later payoff. (developmt $ more, but O/M lower)
7. Improves focus on instruction/other. Impacts future practice.
8. Focus on the things that really matter. Midterm and real-time assessments important.
9. Challenge in balancing breadth and specificity of goals. Measurables don't always match. More on this later.
10. Needs to be inclusive process so ownership is felt by all stakeholders.
11. Timing of assessment vs. evaluation is critical at all levels.
12. Most goals qualitative, but many measures are quantitative. More on this coming up soon.
13. Think beyond normal boundaries. Stakeholders will do this. Get broader context.
14. Can't generate measures for assessment without performance criteria. (Again, more on this later.) Must follow the steps so results make sense. Again, recall it is recursive.
15. Outside contributors helpful. This is about bringing stakeholders to the table.
16. Process recursive, again, even though systematic. There are built-in checks and balances.

7. Performance criteria (aspects should ID most important and be organized around a fluid presentation; should be unambiguous, concise).

a. Identify the quality and its characteristics.
    a. Example: rigorous = (write a list,)
        i. strong writing performance,
        ii. improvement oriented,
        iii. high expectation for assessment/communication,
        iv. higher level of learning (Bloom's taxonomy) than other classes,
        v. greater breadth and depth of knowledge
        vi. high performance (professional/competitive) environment

    (look for theme or pattern)
        theme: high performance core and the other items clarify

    (now, look away and make a descriptive statement, look back to review, and refine)

    Rigorous – a high performance environment, with clear expectations, strong performance criteria, effective and timely assessment, where students perform through writing, research, and teamwork, resulting in high level learning outcomes.

    (Ask question: If meet the expectation, will others put this label on you?)

    Learning outcomes: 1. competency, 2. articulating knowledge, 3. working expertise, 4. new environment, 5. movement to other contexts (?) High level = at least 3. (I'm pretty sure I missed this stuff. It is in Faculty Guidebook)

    From notetaker:
    1. competencies – what people can do, at what level (e.g., Bloom's taxonomy #4 should be minimum) knowledge based.
    2. movement – in writing in disciplinary context (high level is at least 3; most enter program at level 1); transferable skills; example – engineering design, computer debugging
    3. experience – practitioner ready (when leave school, are job ready)
    4. accomplishment – a resume has been built (e.g., capstone course involving client need; service learning project)
    5. integrated performance – (e.g., knowledge, skills, environment together)

Example: Quality oral & written communication (this is a sequential set though not in sequence)

Clarity
Grammatically correct
Meets audience needs
Sensitive/responsive/meets cultural conditions
Practice (revision if written) – stricken b/c means. Not end result.
Engaging
Paint picture
Provides synthesis.

Accurate (well researched)
Communicate what intended.
Did it have a significant impact (meet purpose of message)
Completeness
Substantiated knowledge base
Organization
Get attn of listener

Communication – Identifies the important msg, appropriate for audience and medium, prepare development process, quality presentation that conforms to expectation of the medium and assess the performance to improve future performance.

7. For biology:

2. Brainstorm
   i. Cost-effective
   ii. Solid foundation of knowledge
   iii. Value at reasonable cost
   iv. Opportunity in research
   v. Quality instructors/dedicated
   vi. Preach what practice
   vii. Faculty morale
   viii. Morale link to pay
   ix. Will top grad schools appreciate the degree
   x. Challenging
   xi. Highly productive faculty
   xii. Nationally and internationally recognized.

Dedicated instructors:

Committed - Views the class/education/teaching as important
Readily available
Care
Respectful
Honest
Fair
Consistent
High standards – move to challenging
Knowledgeable
Effective (move yellow elsewhere)

Dedicated instructor – is committed to the educational process, so that s/he treats the students with respect, demonstrates fairness, is honest, is knowledgeable, is consistent, is available, cares about the students, and is effective.

Dedicated instructor – a very committed educator to the student and their needs, by being caring, respectful, available and willing to mentor their growth.

Conclusions/what learned from peer assessment

1. Outside input b/c look at it with fresh eyes
2. get ideas from other group
3. lots of feedback both ways.
4. assessor and assessee grow. Learn better how to put your own together when you assess other pple's assessmts. Presenter's idea: have a team that assesses assessments so that college/unit grows.
5. SII forces a positive/assessmt spin, instead of judgmental eval.
6. multiple input strengthens product – internal (COS) and external (outside COS)
7. Ag/life sciences & radiography – outside input deal, learn about others and what the groups are about; useful for administrators – esp. who are and who are not component. Admin pple can know better the goal of the program. Communication tool for quickly communicating program to other.
8. Communicate in plain jargon, clear, explicit language. Iterate until communicating with outside world. Develop external language.
9. stmts can become defensive b/c of univ. battles. Be affirmative in mission and focus on mission, instead of internal and external battles. Presenter's reword: leads to mindset where feel good about program instead of defensive. As other pple understand your program better, picking program apart transforms to understanding. Present program instead of defending it. Confidence increases.
10. when looking for improvements, don't necessarily look for weaknesses. Prioritize by importance to program. Not necessarily improving a weakness, but the most important area of program – greatest opportunity for growth. Changes culture of providing and receiving feedback. (Critical point here.)
11. go through a cycle. Need to act and reflect on action. Need both to produce. Presenter's expansion: algorithm w/time allocation is plan (10%), do (85%), reflect/assess (5%).
12. feedback has to be imbedded in assessmt. Recursive problem solving. Need outside and inside. Seek feedback actively from other programs. Presenter's comment: must challenge people to continue. Need continual accountability. (a human behavior thing) develop the reciprocal relationships and set meeting times.
13. we understand the goal of assessmt in class, but role tends to escape us at dept/college level (internal and external). Presenter's corollary: graduates will be in same situation when graduate. Need to see models of assessmt outside the classroom. Example: lack of assessmt in K-12 education. An area for research and publication.

Back to performance criteria: need two more.

7. For biology:

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    i. Cost-effective
    ii. Solid foundation of knowledge
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    iv. Opportunity in research
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Qualified graduates for advanced study – Fully qualified graduates who are consistently accepted in graduate or health professional schools of choice because of their documented abilities to carry out independent laboratory work, undergraduate research, and effective problem solving.

Another criterion – teaching students how to set goals, help guide, how to acquire information, develop professional skills/plan. Perhaps develop a handbook or website or worksheet type thing and a workshop. Also develop for job-seekers.

Research: Extensive, widespread research effort with collaboration among students and external researcher resulting in highly-funded research projects and significant numbers of peer-reviewed journal articles and presentations.

Effective instructor: Dedicated, capable, and good at communicating knowledge to the students. This requires solid understanding of the field.

Sub-criterion: ***Dedicated instructor – a very committed educator to the student and their needs, by being caring, respectful, available and willing to mentor their growth.***

Another (job-readiness?): consider the stakeholders and job-readiness.

8. Identify up to three attributes (measurable characteristics) for each criterion.

a. Qualified graduates - MCAT/GRE scores, % acceptance into grad/professional programs, request scores on senior survey or otherwise get students involved in process, more developmt on exit survey to get sense of how students regard the prep for application processes. Need to develop information about where graduates are going.
b. Research – publications, research dollars, number of undergrads per lab
c. Effective instructor: peer review/assessmt, student eval, earned degree, exit survey. Alumni surveys/feedback.

Examples of doing step 8: select the most important thing(s) that you want to measure to know if you are performing. How you measure is a different question.

EX1. Perf criterion: interdisciplinary. An integrated understanding of how different disciplines interact w/neurobiology by building on a core knowledge base in the liberal arts, physical sciences and mathematics, in order that physical sciences and mathematical concepts can be creatively applied to solve problems in biology and that similar concepts are recognized when they are engaged in different contexts.

Attributes: ability to transfer to new contexts (ask, what are we going to measure)
(Also problem solving, but perhaps a different quality. Not really interdisciplinary.) for this exercise, consider the problem solving as the 2nd thing we want to measure.
3rd - Ability to converse in other disciplines (and lay language if presenting outwardly).

Measures of interdisciplinarity:
- Ability to transfer to new contexts
- Ability to converse in language of other disciplines
- Creativity

Note: Problem solving is a different quality that should as well be measured alone.
Note: Core knowledge base is akin to knowledge table (see faculty handbook)
Note: Research ability may be another area to be measured

EX2: context – service science courses for other programs/depts

Responsiveness: Program recognized the needs of our constituencies and is regularly reassessed with delivery mechanisms for service courses designed to account for institutional resources as well as new research technologies and methodologies that meet the need of a heterogeneous audience.

Measure:

- Client satisfaction (note – time to respond to requests for change in content is part of client satisfaction)
- Ability to do needs analysis, so can improve even if already satisfy client

EX3: Shared focus with autonomy: The world civilizations faculty has a shared focus and achieves program goals through different means.

Note: two qualities intersect here.

Measure:

- Degree of consensus on outcomes
- Degree of coercion in system or, on the positive, the measure of academic freedom

  This gets at finding out the standard measured outcomes and letting people get there by whatever means they want.

More practice: narrow down to 3 items.

8. Identify up to three attributes (measurable characteristics) for each criterion.

a. Qualified graduates – Placement. Notes on method: score placements to get an index. Compare every year. (note: our original was: competitiveness, likeliness of success. Question: what is success?)
b. Research – quality of the opportunities/possibilities for research, quality of labs that students can participate in, level or depth of participation
c. Effective instructor: satisfaction of clientele (note this involves student engagement, engagement of faculty member, dedication element), measure student competency
d. Job-readiness – ability to transfer coursework to applied environment? – perhaps have students create a portfolio

Weighing attributes – must wait for later.

Means – how do you collect data
Instrument – how do you analyze data

Criterion	Attribute	Weight	Means	Instrument	Benchmark (current) this is a standard –tells the world this is the quality we have. Set it so you can beat it.	Target (future) this is a standard. Keep it reasonable for publishing purposes.	Accountability
Qualified	Placement		Senior	Index of			

Graduates			exit survey	quality of school			
Qualified Graduates	Placement		Student plans ???	Recommendations/transcripts ???			
Qualified Graduates	Placement		Standard-ized tests	Test score (GRE, MCAT)			
Research (impact on ug program)	Depth of participa-tion		Survey faculty and student	Responses of student/faculty (modify directed study survey)			
Research	Quality of the opportune-ities		Faculty annual reports	Publications involving undergrad students			
Research	Quality of the opportunities		Faculty annual reports	grant dollars,			
Research	Quality of the opportunities		Faculty annual reports	number of students			
Research	Depth of participation		Student poster (perhaps expand to 1-pg paper or exit survey)	Review student poster/paper. (Develop scale for review. Possibly modify exit survey.)			
Research	Depth/extent of participation		Under-graduate grant proposal	Rated for monetary award			
Effective instructor	Client satisfaction		Alumni survey	Responses to questions			
Effective instructor	Client satisfaction		Alumni donations	Dollars contributed			
Well-respected researcher	Quality of opportunity		Faculty annual report	publications			
Well-respected researcher	Quality of opportunity		Faculty annual report	Stature shown by awards/honors, invited			

				presentations,			
Well-respected researcher	Quality of opportunity		Faculty annual report	External support			
Well-respected educator	Quality of opportunity		Faculty annual report	(Nominations for) awards			
Well-respected educator	Quality of opportunity		Senior exit form	(modify to …) student recommendations or commendations			
Quality job-ready students	???		Portfolio	Look for reasonable documents such as a resume, some kind of job or career goal, awards/activities, etc.			

Future possibility:

Effective instructor	Student competency		Final project(s) like Capstone	Grade assigned???			

Fundamental conflict: resources vs. ideals. How to measure something like quality of graduates? Should that be a criterion? See yellow highlights above. Perhaps a new means would help. This would be internal, while students are present and can produce something that is manageable.

ANNUAL ASSESSMENT REPORT

Written in May. Team of 2 or 3 in a couple or hours, depending on development prior to May. Fix up in a pamphlet for multiple-purpose use.

Content:

- Cover with graphic and program name
- Inside cover has steps 1 – 6.

- Page 3 lists most important performance criterion (not measures). The criterion is the title of the page. Then list the two most significant accomplishments for the criterion on the page. Collect the evidence and write up a couple of sentences. Now, a new section – other accomplishments, most important first, in a single line each. Now a section of effort (=activities). This is a table, 4 -5 columns by 4 – 5 rows with a phrase or two describing. Not categorized. Just a list in array form. Note the activities lead to the earlier accomplishments. (75% of page is on strengths) Now list areas for improvement as "Action items for next year." Presents as doing this because want to get better. Also do a "Future action items" list at bottom of page.
- Continue with one criterion per page.
- Last criterion should be "continuous quality improvement" or an assessment-minded page.
- Add a last page of schedule of events to send out to stakeholders (in summer). Esp. consider students/faculty want to recruit, donors, alumni, budgeters… can post online but the accesses different groups of people. This creates a marketing tool.

These reports create a tracking trail.