

Assessment of the General Education Curriculum:  
Natural Science Category

*Faculty Focus Group Report*

June, 2008

Meeting Held

November 14, 2007  
9:30 a.m. – 11:30 a.m.  
156 University Hall

General Education Curriculum Natural Science Course  
and  
Faculty /Instructor Participants

Anthropology 200	Debra Guatelli-Steinberg
Biology 101	Neil Baker
Biology 101	Jefferson Roberts, Newark Campus
Biology 114	Thomas Hetherington
Chemistry 122	Russell Pitzer
Food Science & Technology 201	Michael Mangino and Stephanie Smith
Geography 120	David Porinchu and Bryan Mark
Human Nutrition	Jackie Buell
Physics 111	Fengyuan Yang

Facilitator

Judy Ridgway, Center for Life Sciences Education

Observers

Alexis Collier, OAA and Chair, ASC Sub-Committee on Assessment  
Steve Fink, ASC Sub-Committee on Assessment

Recorder

Kate Hallihan, ASC

## Introduction

The program of General Education (GE) at The Ohio State University (OSU) is delivered through a distributional model in which students are required to take course work in eight categories of study. Each category has distinct expected outcomes that students are expected to achieve through coursework approved for that category. To help evaluate whether students achieve these outcomes, and to use information about student learning for ongoing improvements, the Colleges of the Arts and Sciences (ASC) Assessment Plan for GE calls for assessment at the course, category, and overall program levels.

At the category level, faculty focus groups were planned as an indirect means of assessment. To pilot this method, a focus group of faculty who teach within the Natural Sciences category of the General Education Curriculum (GEC) was set up to:

- obtain faculty instructor opinions about student learning with respect to the Natural Science GEC goals and objectives (see Appendix 1 for listing of goals and objectives)
- gather category-specific information that could be used to improve the curriculum, its delivery, and the achievement of outcomes (see Appendix 2 for meeting agenda and additional details), and
- facilitate faculty communication about assessment and expected outcomes.

## Procedures

The procedures and question topics for the faculty focus group in Natural Sciences were developed and coordinated by the Chair of the ASC CCI Sub-Committee on Assessment in consultation with the assessment committee members, the Associate Deans in the College of Biological Science and Mathematical and Physical Science, and the staff of the ASC Office of Curriculum and Assessment. The ASC Office of Curriculum and Assessment provided support and resources.

A set of Natural Science GEC courses were identified that had large enrollments and represented both the biological and physical science areas across several departments and colleges. Sequenced courses, which students must take, courses with laboratories, also a GEC requirement, and stand alone natural science GEC courses were included. From this course set, departments were contacted to identify faculty who were the primary instructors for the courses or coordinators of the larger instructional programs. Regional campus faculty were included. Forty faculty were identified and invited by electronic mail to participate. Approximately 40% of those contacted responded. The meeting was set at a time that accommodated the most potential participants. The final set of eleven participants included instructors from Anthropology, Biological Sciences, Chemistry, Food Science & Technology, Geography, Human Nutrition, Microbiology, and Physics.

Prior to the meeting participants were provided a copy of the GEC learning goals and objectives for the Natural Science category, and student opinion data regarding

their learning in the Natural Sciences from two ASC graduating senior surveys (2006 and 2007) (see Appendix 3).

At the meeting, the Chair of the ASC Sub-Committee on Assessment welcomed the participants and introduced the purpose of the meeting. The focus group proper was facilitated by an assessment specialist who had experience conducting focus groups and was familiar with the natural sciences curriculum. The Director of the ASC Office of Curriculum and Assessment audio taped the meeting and took notes on a laptop computer. One additional faculty member from the ASC Sub-Committee from a non-natural science area attended to observe. Neither the Chair of the Sub-Committee nor the Director of the Office of Curriculum and Assessment participated in the formal discussion.

Following introductions, the Chair of the Assessment Sub-Committee gave a brief overview of the meeting, the procedures that would be followed, and how the faculty input would be summarized and used to help assess student learning in the Natural Science category. The meeting was then led by the facilitator who used a semi-structured approach for an approximate one-hour discussion. The dialogue was framed around nine questions shown in Appendix 4. Follow-up questions were asked to elucidate respondent comments. After the group had addressed the questions, the facilitator summarized her observations and asked for clarifications. The participants were thanked for their comments and contributions. Any remaining questions were addressed.

The Director of the ASC Office of Curriculum and Assessment summarized the notes, checked their accuracy with the recording, and aligned typical responses with the questions asked. Any apparent outlying responses were noted. She, along with the group facilitator and Chair of the Assessment Sub-Committee, next reviewed the findings, identified themes, considered whether any significant affective responses had been observed, and drew preliminary conclusions. The synthesized summary was then given to the faculty Sub-Committee member who had attended the meeting for independent feedback. The main themes that were found, and representative responses to the questions, are described below.

### Findings

All attendees participated in the focus group although not all attendees responded to every question. Participants tended to concur in their overall evaluations and opinions.

#### *Response Themes*

- Faculty were engaged, supportive of the focus group process, and appreciative for the opportunity to exchange information and ideas.
- All participants endorsed the General Education Curriculum, expressed that they were covering all aspects of the GEC Learning Goals and Objectives in their courses, and concurred that the GEC Learning Goals and Objectives were appropriate and did not need to be revised.

- Although many faculty acknowledged that they had not been collecting evidence to demonstrate students are achieving set learning outcomes specifically, they were interested in learning about how to measure these outcomes. They were also supportive of moving forward with formative outcomes assessment.
- Participants repeatedly expressed frustration about the lack of motivation many non-science student majors had when required to take science courses.
- There was a perceived need for greater communication among instructors who are teaching the same courses, especially across campuses. In some instances the sometimes lack of instructor communication or coordination in sequenced courses was revealed, particularly for sequences offered across departments and disciplines.
- There was not time to discuss at length the roles of laboratories and recitations in the courses represented.

*Representative Responses to Discussion Question Topic*

Topic	General Response
Approach to GEC Objectives	<p>Student motivation is a problem.</p> <p>Engaging students with real-world application of material that they could relate to their own lives increases motivation and learning.</p> <p>All objectives are addressed.</p> <p>Continuity across sections is maintained in some courses by some by sharing materials across instructors and in Graduate Teaching Associate (GTA) meetings.</p>
Measures of Student Success in Meeting GEC Objectives	<p>Some use explicit embedded testing.</p> <p>One program uses Student Assessment of Learning Gains (SALG).</p> <p>Most instructors are not directly assessing student success with respect to GEC goals and objectives.</p>
Implications of ASC Exit Survey	<p>Findings are important to use as formative data.</p> <p>It is too early for the students to understand the advantages of what they learned in GECs.</p>
Articulation of GEC Sequences	<p>Some have tight articulations and others have none.</p> <p>In many cases, it is hard to assume prior knowledge.</p>
Importance of Laboratory	Laboratory supports the lecture.

Component	
Fit of GECs in Courses for Special Populations	Coverage of GEC objectives are not sacrificed.
Suggested Changes to the GEC Objectives	Keep objectives unchanged.
Concerns about GEC Education	Faculty need and requested reminders of intent and expectations for GEC courses.  Regional campuses need to be part of the conversation.  Student learning, not budget matters, needs to be the focus of GEC instruction.
Focus Group Participant Benefits	The group discussion was helpful.  Faculty recognized that sometimes there was a lack of communication in across-department sequences.  Learning about ways to assess was beneficial.

#### *Additional Observations*

- In some instances, faculty appeared to have given little attention to the fact that a course they were teaching could be used as part of a sequence.

#### Discussion and Next Steps

The focus group method, findings, resulting conclusions, and next steps were discussed at the January 3, 2008 meeting of the ASC Sub-Committee on Assessment. The committee determined the methodology provided beneficial information and should be continued to help assess outcomes for other GEC categories. For the Natural Science category in particular, the committee concluded that faculty are covering GEC Objectives in this category even though the primary rationale for offering some courses may be for reasons other than their GEC status.

The committee discussed at length the finding of the great variation in the articulation of expected learning outcomes for courses in Natural Science sequences. Some sequences have a great amount of articulation while others appear to be independent offerings across departments. The committee considered whether additional guidelines should be established for what constitutes a sequence and will raise this possibility with the Chair of the full ASC CCI. In addition, the committee made the following recommendations:

- Pursue finding and implementing a mechanism to provide regular reminders to GEC instructors that the courses they are teaching are part of the GEC and have faculty developed expectations for student achievement in them.
- Continue to provide training and support for formative assessment activities for GEC Objectives.
- Provide a forum for instructors to discuss the articulation between GEC Natural Science sequences offered across departments.

The focus group findings will be used in conjunction with other Natural Science outcomes information in a comprehensive assessment report for the Natural Science category. The report will be shared with the University-level Advisory Committee for the GEC and the ASC Committee on Curriculum and Instruction.

## Appendix 1

### General Education Program Goals and Objectives

#### *Natural Science*

##### **Goals/Rationale:**

Courses in natural sciences foster an understanding of the principles, theories and methods of modern science, the relationship between science and technology, and the effects of science and technology on the environment.

##### **Learning Objectives:**

1. Students understand the basic facts, principles, theories and methods of modern science.
2. Students learn key events in the history of science.
3. Students provide examples of the inter-dependence of scientific and technological developments.
4. Students discuss social and philosophical implications of scientific discoveries and understand the potential of science and technology to address problems of the contemporary world.

## Appendix 2

### Focus Group Meeting

#### **Natural Science Focus Group**

November 14, 2007  
9:30 a.m. – 11:30 a.m.  
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#### I. Introductions

#### II. Purpose

- Gather information to improve the general education program and student learning
  - Identify problems / difficulties (delivery / achieving learning / curriculum)
  - Refine expectations (goals / criteria)
  - Consider role of laboratories, recitations
  - Review course sequence approach to knowledge building
- Increase faculty awareness of purpose and goals of general education
- Reinforce culture of assessment
- Share best practices (instructional; assessment)

#### III. Focused Discussion

#### IV. Summary Observations

## Appendix 3

### ASC Exit Survey Data

#### ASC Exit Survey Summary Data Spring 2007 & 2006\* Natural Science GEC Category Focus

Numbers reflect the % of students who responded to the questions selected below with 4s and 5s on a 5-point Likert scale in which 5 represented “a great extent” and 1 represented “not at all.”

Results of the complete survey, with reports created by major (when possible), college, and overall, may be found at: <https://ascnet.osu.edu/reports/senior/>

\*The survey administered Spring 2006 was revised in Spring 2007; therefore different questions were used.

#### **Spring 2006 Exit Survey**

6. How familiar are you with the educational goals of the General Education Curriculum (GEC)?

	Overall	ART	ASC	BIO	HUM	MPS	SBS
% of 4s & 5s	50	35	62	43	58	39	51

12. Natural science GEC courses (e.g., Biology, Chemistry) helped my understanding of:

% of 4s & 5s in	Overall	ART	ASC	BIO	HUM	MPS	SBS
Principles & theories of modern science	51	47	40	85	48	69	44
The relationship btw science & tech	46	42	34	78	51	63	41
The effects of science & tech on the environment	48	47	44	72	44	51	43

17. To what extent do you think course work you have taken in the GEC Natural Sciences category will be IMPORTANT to your overall future success?

	Overall	ART	ASC	BIO	HUM	MPS	SBS
<b>% of 4s &amp; 5s</b>	38	25	26	81	30	69	32

**Spring 2007**

**11. GEC Section: To what extent have your knowledge, skills, abilities, and personal development improved in the following areas since you began your education at Ohio State?**

<b>% of 4s &amp; 5s in</b>	Overall	ART	ASC	BIO	HUM	MPS	SBS
<b>Natural Science (Bio &amp; Physical)</b>	47	29	41	94	31	71	39
<b>Use of scientific methods &amp; concepts</b>	56	32	34	89	36	83	60

## Appendix 4

### Focus Group Questions

#### Category Level GEC Outcomes Review Focus Group Questions

1. In your GEC courses, how do you approach the learning objectives listed on your handout? Are they all in your courses?
2. How do you know students are learning what is intended with respect to the natural science goals/objectives?
3. What do the results of the ASC Exit Survey suggest? (Let participants review the data regarding the specific questions chosen on the survey)
4. Requirements vary slightly for BA and BS programs, but everyone needs a 2 course science sequence. How well are those sequences articulated? What do students learn in the first course that prepares them for the second? Are all the GEC objectives addressed in both courses?
5. Some coursework in laboratory experience is required. How do laboratories in natural science and recitations contribute to student learning (esp. regarding the GEC objectives)?
6. **Optional** Some courses with GEC status in this category have been developed primarily for reasons other than general education. For example, a physics course might have been designed primarily to cover content required for pre-med students, and might sacrifice some GEC objectives in doing so. How do these fit with your conceptualization of GEC practices?
7. If you think the learning objectives should be changed, what changes do you suggest?
8. Are there any concerns/issues/problems you would like to bring to our attention with respect to the Natural Science GEC category that were not covered in our questions? (or were we going to have an 'other' question any way?)
9. What kinds of practices have you learned about today that you think will be helpful in your natural science GEC course or in teaching GEC expected outcomes, and/or practices you think are useful that you would like to share with other instructors?