

Writing and Assessing Student Learning Outcomes to Improve Classroom and Program Effectiveness

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**University System of Georgia Faculty Development Workshop
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Webcasting logistics

- Questions during the presentation:
 - Email: jon.gordon@gatech.edu
- For copies of the handouts
 - www.cetl.gatech.edu/faculty/scholarship.htm
 - (scroll to bottom of page)

Workshop Activities

- **Identify why we are here**
- Demystify assessment
- Practice writing course learning outcomes
- Discuss classroom assessment tools and techniques
- Explain program assessment
- Link classroom and program assessment
- Collect your feedback

Planned Workshop Outcomes

By the end of this session, we expect you will have:

- Gained a clear understanding of the process and purpose of assessment
- Considered how assessment serves as a vehicle to address important questions regarding teaching and learning in your courses and programs in a systematic way
- Identified one or more links between course, program and institutional levels of assessment
- Obtained useful information about resources and tools available to aid in assessment projects at any level

What about your own goals for today? See handout 1

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Assessment is not about getting it right, it is about getting it better!

Assessment is the systematic collection, review, and use of information about educational programs undertaken for the purpose of improving student learning and development

-Ted Marchese

The assessment process is cyclic

- Create/revise learning outcomes
- Choose/revise teaching methods
- Choose/revise assessment tools

Create action plan

Implement

- Conduct learning activities
- Collect formal and informal data

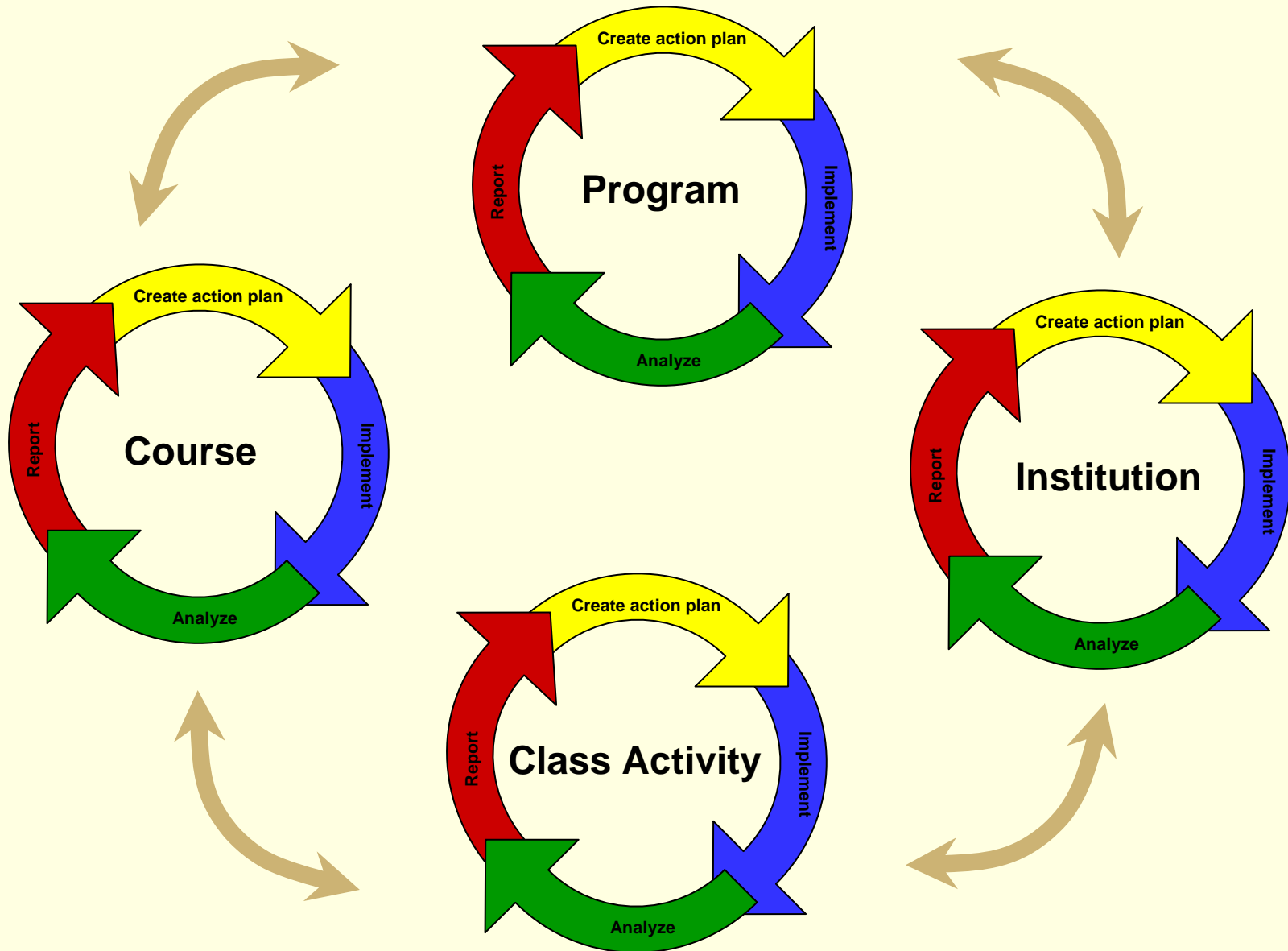
Analyze

- Study data
- Identify important results

Report

- Summarize results
- Identify strengths, areas for improvement, insights

The assessment process occurs at multiple levels



Assessment involves dialogue

Student ↔ Instructor

Faculty ↔ School

Faculty ↔ Institute

Institute ↔ Stakeholders



Compare results intended with results achieved

Provide usable feedback for

- teaching effectiveness
- course and curriculum planning
- evidence of program accountability to stakeholders

Assessment and evaluation use similar methods but for very different purposes

Assessment –

The *process* of measuring and analyzing a performance *for* the purpose of *improving a future performance*

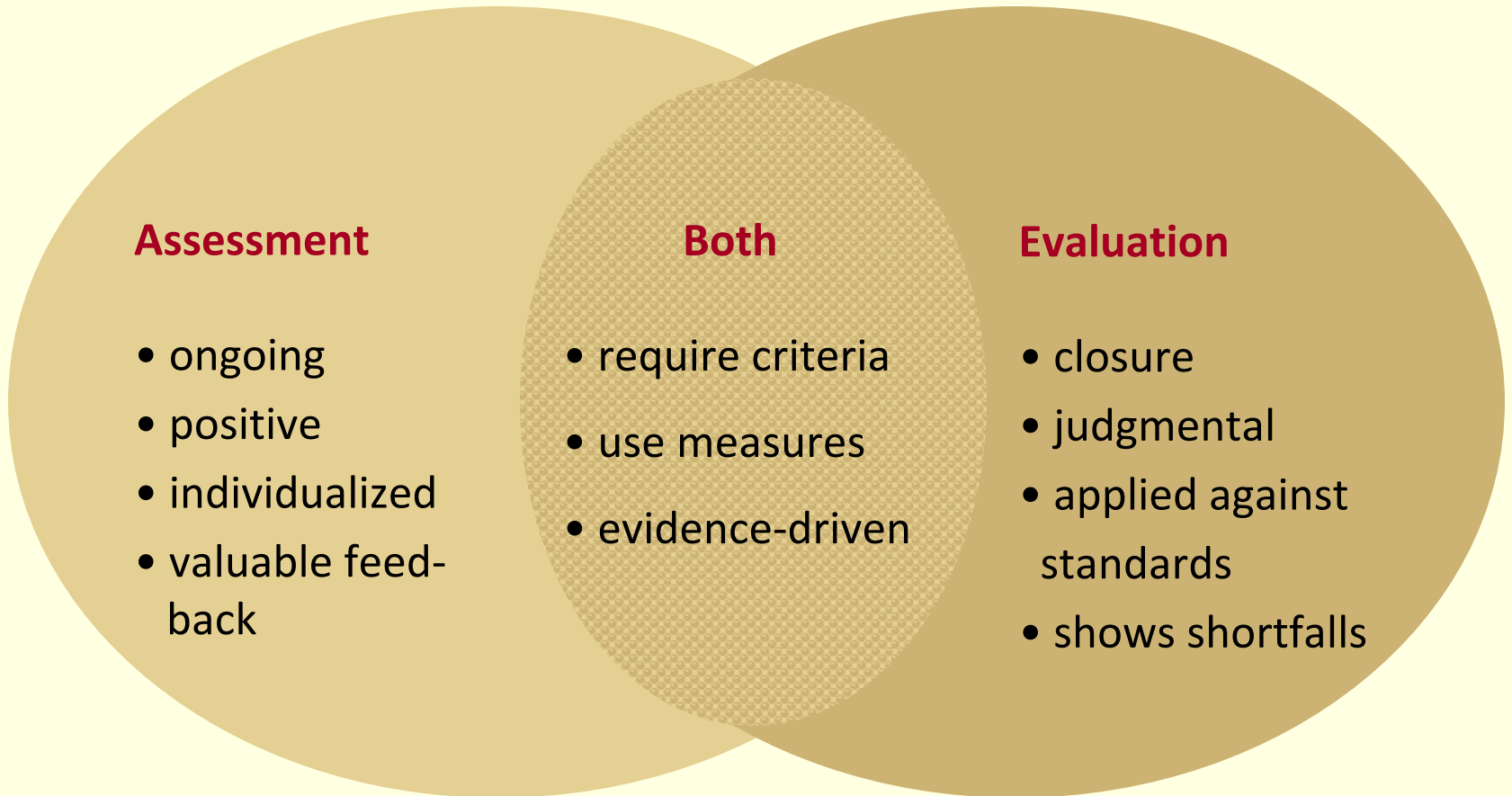
What we do for USG and SACS.

Evaluation –

The *process* of measuring a performance against a set of standards *to determine the level at which* the *standards were met*

What USG and SACS does to us!

Assessment/Evaluation Relationship



Classroom vs. Program Assessment

Classroom-level Assessment –

Used to facilitate
improvement in
teaching and learning

Program-level Assessment –

Used to facilitate
improvement in
curricula

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First steps in quality assessment – Writing measurable learning outcomes

Why do this?

- Clarifies expectations of students; what you expect them to be able to do, what they can expect to learn in your course
- Gives the instructor a set of reference points for student performance
 - Helps you step outside the content of your course and think about it in a larger context
 - Makes it easier to create tests and assignments to evaluate student performance

Quality measurable learning outcomes can be identified in several ways

Properties of measurable outcomes

- Have a clear *purpose*
- Use *action words*
- Describe *meaningful* learning
- Result in *observable* behaviors/products
- Represent *high level* learning
- Are easily *understandable*

See handout 2 – page 1

Courses and programs should include several types of learning outcomes

Types of learning outcomes

- Competency
- Movement
- Accomplishment
- Experience
- Integrated Performance

common

less common

See handout 2

Working with example outcomes

How might you improve any or all of the following?

- Understand Newton's three laws of motion. (competency)
- Identify unknown bacteria using gram stain, biochemical, and other microbiological methods for identification. (competency)
- Appreciate the difference between various forms of graphical representation. (competency)

Working with example outcomes

Improved versions of the first and third outcome:

- Use Newton's three laws of motion to predict motion in three dimensions.
- Identify unknown bacteria using gram stain, biochemical, and other microbiological methods for identification. (competency)
- Given a set of data, construct a time series, scatterplot, or histogram to show relationships between quantities. (competency)

See handout 2 – page 2

Bloom's Taxonomy provides helpful structure in writing learning outcomes

Levels of learning:

- Knowledge
- Comprehension
- Application
- Analysis
- Synthesis
- Evaluation



Action verbs
at each level
(McBeath)

See handout 2 – page 3

Learning outcomes can be formulated in a systematic way

- Use action verbs
- Should be observable (either directly or indirectly inferred)
- Method
 - Inventory of course context
 - Rank most important items
 - Categorize by outcome type
 - Draft outcome statement
 - Revise using criteria for quality outcomes

See handout 2 – page 4

Sharing example outcomes

- What have you come up with?

How might we measure your outcomes?

- Let's brainstorm a list of ideas

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Classroom Assessment

- Purpose: Improve degree to which classroom activities enable students to master knowledge, skills, and abilities acquired in a course
- Use of results: Confirm current teaching methods, identify areas for possible improvement
- Unit of analysis: Students within a single class

Why do classroom assessment?

- Improve teaching
- Improve learning
- Serve program needs
- Support grant activities
- Focus classroom activities on what is really important

Measuring your outcomes: Direct assessment methods

- Written exams
- Oral exams
- Performance assessments (CATs)
- Standardized tests
- Licensure exams
- Oral presentations

- Projects
- Demonstrations
- Case studies
- Simulations
- Portfolios
- Juried activities with outside panels
- CATs - various

Measuring your outcomes: Indirect assessment methods

- Surveys
- Interviews
- Focus groups
- Employer satisfaction studies
- Advisory board feedback
- Job/grad school placement data
- CATs - various

Measuring your outcomes: Some common CATS

- Background knowledge probe
- Focused listing
- Think-pair-share
- Minute Paper
- Directed Paraphrasing
- Documented Problem Solutions

See handout 3

BREAK TIME!

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Program Assessment

- Purpose: Improve degree to which students achieve overall knowledge, skills, and abilities expected in a degree program
- Results: Used to improve curriculum (e.g., course sequencing, particular areas of study), co-curricular offerings, teaching effectiveness, admissions criteria
- Unit of analysis: Degree program

Why have program outcomes?

- To build and sustain program excellence over time
- To give faculty feedback and the ability to make curriculum modifications based on measurable indicators, not anecdotes
- To inform and motivate students
- To communicate with stakeholders about what we do and how well we do it
- To meet external standards for accountability
- \$\$\$ (Grants!)

Program outcomes versus objectives: Terms can be confusing

- For example, ABET makes the following distinction:
 - **Program Objectives:** “...broad statements that describe the career and professional accomplishments that the program is preparing graduates to achieve.”
 - **Program Outcomes:** “...statements that describe what students are expected to know and be able to do by the time of graduation. These relate to the skills, knowledge, and behaviors that students acquire in their matriculation through the program.”
- **Operational Objectives:** Managerial goals for a program (e.g., The program will admit 10% more students next year, with 5% higher overall SAT scores.)

Program outcomes: What might they look like?

- Only most important broad student learning results desired from program
- Describe what is to be achieved
- State in terms of expected behaviors
- Measurable

Program Assessment

Program outcome examples:

- **BS Computing:** Graduates will be able to apply mathematical and computing theoretical concepts in solution of common computing applications, such as computing the order of an algorithm.
- **BS Aerospace Engineering:** Graduates will have the ability to analyze and design airfoils and wings, accounting for viscous and compressibility effects.

Program Assessment Methods

- Use triangulation, multiple methods.
- Remember: The same method may cover more than one outcome.
- Consider the reliability, validity, and quality of methods. Will we be willing to trust the results?

Use of assessment methods is similar to use of classroom assessment techniques

- Seeding questions into quizzes and exams
- Collecting samples of student work in a portfolio
- Use of grading rubrics for student work
- Surveys and focus groups of students
- CIRP, NSSE, Exit Surveys, Alumni Surveys
- Other examples?

Share the results of what you do with the rest of the campus community

- Specify mechanism for timely dissemination of results to faculty, such as an annual retreat, curriculum committee meetings, etc.
- Provide venue for critical reflection:
 - How do we know we're accomplishing our mission?
 - What evidence would help us determine?
 - How might we demonstrate how we add value?
 - How might we use information to advance our agenda?

OATS — Online Assessment Tracking System

The screenshot shows a Mozilla Firefox browser window titled "Office of Assessment Tracking System - Login - Mozilla Firefox". The address bar displays the URL "https://gtwebapps.gatech.edu/cfeis/oats/login.cfm". The browser's menu bar includes "File", "Edit", "View", "History", "Bookmarks", "Tools", and "Help". The toolbar contains navigation buttons (back, forward, home, stop, refresh) and a search engine dropdown set to "Google". The browser's status bar at the bottom shows "Done" on the left and "gtwebapps.gatech.edu" on the right.

The main content area of the browser has a yellow background and contains the following text and elements:

- Georgia Institute of Technology
- Online Assessment Tracking System**
- OATS Login**
- Please enter your GT Account and password
- GT Account username
- GT Account password
- Login
- To our SACS reviewers: Do not install the Java software for OATS. It is not needed for your review.
- Installation Setup (opens in new window)
- Test the Installation (opens in new window)
- A list of requirements:
 - This application supports Internet Explorer 6.0
 - Cookies and JavaScript must be enabled for this application.
 - Install **Java 2 Standard Edition, version 1.4 (Java 2 SE v1.4)** or greater.
 - For MS Windows, Macintosh, Solaris, Linux, and Java requirements and download links, please see the [OATS System Requirements and Recommendations](#) (opens in new window).
- A disclaimer at the bottom: *By logging into this application, I agree to adhere to the [GT Data Access Policy](#) and [Computer and Network Usage Policy](#) as well as all other GT policies governing the appropriate use of Institute Resources.*

OATS — Online Assessment Tracking System

The screenshot shows a web browser window titled "Online Assessment Tracking System - Main Menu - Mozilla Firefox". The address bar displays the URL "https://gtwebapps.gatech.edu/cfeis/oats/index.cfm". The browser's menu bar includes "File", "Edit", "View", "History", "Bookmarks", "Tools", and "Help". The toolbar contains navigation icons (back, forward, home, stop, refresh) and a search box with "Google". Below the toolbar, there are icons for "Instant Message", "WebMail", "Radio", "People", "Yellow Pages", "Download", "Calendar", "Channels", and "RealPlayer".

The main content area has a yellow background and features the following elements:

- Online Assessment Tracking System**
Main Menu
- Navigation links: [Instructions](#), [Admin](#), [Logout](#)
- Announcement: **Assessment Updates Are Due December 15, 2008 for Academic Years 2006-07 and 2007-08**
- A central box containing three buttons:
 - [Edit Current Annual Assessment Update](#)
 - [View Current Annual Assessment Updates](#)
 - [View Previous Annual Assessment Updates](#)

The status bar at the bottom shows "Done" on the left and "gtwebapps.gatech.edu" on the right.

OATS — Online Assessment Tracking System

OATS View Annual Assessment Updates - Mozilla Firefox

File Edit View History Bookmarks Tools Help

https://gtwebapps.gatech.edu/cfeis/oats/aa_history_choose_asmt.cfm?ay_pk_id=2006

Instant Message WebMail Radio People Yellow Pages Download Calendar Channels RealPlayer

Main Menu Program Menu History Menu Instructions Admin Logout

View 2005-2006 OATS Annual Assessment Updates

Unit:

	College, Unit: Degree Program(s)
View	College of Architecture, Architecture PhD Programs: Doctor of Philosophy
View	College of Architecture, Department of Architecture: Bachelor of Science
View	College of Architecture, Department of Architecture: Master of Architecture
View	College of Architecture, Department of Building Construction: Bachelor of Science in Building Construction
View	College of Architecture, Department of Building Construction: Master of Science in Bldg Const/Integrated Facility Mgt
View	College of Architecture, Department of City Planning: Master of City & Regional Plan
View	College of Architecture, Department of Industrial Design: Bachelor of Science in Industrial Design
View	College of Architecture, Department of Industrial Design: Master of Industrial Design
View	College of Architecture, Department of Music: Bachelor of Science in Computational Music
View	College of Architecture, Department of Music: Music Minor and Certificate
View	College of Computing, College of Computing: Bachelor of Science in Computer Science
View	College of Computing, College of Computing: Master of Science in Computer Science
View	College of Computing, College of Computing: Master of Science in Hum-Computer Interaction
View	College of Computing, College of Computing: Master of Science in Information Security
View	College of Computing, College of Computing: Doctor of Philosophy
View	College of Engineering, School of Aerospace Engineering: Bachelor of Science in Aerospace Engineering
View	College of Engineering, School of Aerospace Engineering: Master of Science

Done gtwebapps.gatech.edu

OATS — Online Assessment Tracking System

OATS Annual Assessment Updates - Mozilla Firefox

File Edit View History Bookmarks Tools Help

https://gtwebapps.gatech.edu/cfeis/oats/aa_updmenu.cfm

Instant Message WebMail Radio People Yellow Pages Download Calendar Channels RealPlayer

Main Menu Program Menu Instructions Admin Logout

2006-2008 OATS Annual Assessment Updates

Unit:

College, Unit: Degree Program(s)	Outcomes/Objectives	Methods	Results	Actions/Impacts	Status
Edit Delete notes	3	5	5	3	Ready for OOA Review
Assessment Update for: 10491 College of Architecture, Architecture PhD Programs: Doctor of Philosophy	28 Sep 2004	08 Dec 2008	08 Dec 2008	08 Dec 2008	
Edit Delete notes	5	15	4		In Process
Assessment Update for: 10618 College of Architecture, Department of Architecture: Bachelor of Science	31 Oct 2006	02 Nov 2005	12 Mar 2009		
Edit Delete notes	5	18			In Process
Assessment Update for: 10659 College of Architecture, Department of Architecture: Master of Architecture	01 Sep 2004	02 Mar 2009			
Edit Delete notes	5	17	17	5	Ready for OOA Review
Assessment Update for: 10619 College of Architecture, Department of Building Construction: Bachelor of Science in Building Construction	28 Oct 2005	14 Dec 2008	16 Dec 2008	14 Dec 2008	
Edit Delete notes	4	12	12	4	Ready for OOA Review
Assessment Update for: 10495 College of Architecture, Department of Building Construction: Master of Science in Bldg Const/Integrated Facility Mgt	28 Oct 2005	07 Nov 2006	13 Dec 2008	14 Dec 2008	
Edit	6	18			Not Started

Done gtwebapps.gatech.edu

OATS — Online Assessment Tracking System

The screenshot shows the OATS web application interface. The browser window title is "OATS - Annual Assessment Update - Mozilla Firefox". The address bar shows the URL: https://gtwebapps.gatech.edu/cfeis/oats/aa_frame.cfm?as_pk_id=10636&ay_pk_id=2007. The browser toolbar includes buttons for Instant Message, WebMail, Radio, People, Yellow Pages, Download, Calendar, Channels, and RealPlayer. The main navigation menu contains: [Main Menu](#), [Program Menu](#), [Instructions](#), [Print Preview](#), [Send Back](#), [OOA Review](#), [Admin](#), and [Logout](#).

The main content area is titled "College of Management" and "For degrees: BS in Management 2006-2008". A left sidebar contains a tree view of assessment categories:

- Update Author
- Program Purpose
- Responsibility and Implementation Process
- Operational Objectives
- 1. Communication Skills
 - Capstone Course Oral Presentation
 - Results of Capstone Course C
 - + Result
 - Alumni Survey
 - Results of Alumni Survey
 - Results of Alumni Survey
 - + Result
 - Rating of Written Cases
 - Results of Rating of Written C
 - + Result
 - Employer Survey
 - Results of Employer Survey
 - + Result
 - Exit Survey

The main content area displays four sections:

- Update Author (name,email,phone)**

Professor Charles K. Parsons, Associate Dean of the Undergraduate Program
Ph. 404-894-4921
E-mail charles.parsons@mgt.gatech.edu
- Program Purpose**

The purpose of the Bachelor's of Science in Management degree is to prepare students for the full range of business areas, helping them to think critically and perform in a highly technological and global economy.
- Responsibility and Implementation Process**

Assessment activities include student exit surveys conducted annually and alumni surveys conducted every 5 years. Assessment of student outcomes associated with the Capstone course, MGT 4195, will continue in 2006/2008 and is expected to be
- Operational Objectives**

For the immediate future, our operational objective is to ensure that we are providing excellent instruction in the core management areas for both our majors and other interested students from the Tech community. We are starting some initiatives to better integrate change of major students from other parts of campus into the College as well as provide better career guidance/job search assistance to

The status bar at the bottom shows "Done" and the URL "gtwebapps.gatech.edu".

OATS — Online Assessment Tracking System

The screenshot shows the OATS web application interface. On the left is a navigation tree with the following items:

- 1. Communication Skills
 - Capstone Course Oral Presentation
 - Results of Capstone Course Oral Presentation
 - + Result
 - Alumni Survey
 - Results of Alumni Survey
 - Results of Alumni Survey
 - + Result
 - Rating of Written Cases
 - Results of Rating of Written Cases
 - + Result
 - Employer Survey
 - Results of Employer Survey
 - + Result
 - Exit Survey
 - Results of Exit Survey
 - + Result
 - Survey of Coop Student Employers
 - Results of Survey of Coop Student Employers
 - + Result

The main content area on the right displays the following information:

Outcome/Objective: 1 *Communication Skills*
 Students will be able to communicate in written, oral, and graphical forms in such a way as to demonstrate their ability to present information clearly, logically, and critically.

Method: 1 *Capstone Course Oral Presentation*
 Student team presentations of capstone project work will be evaluated in sections of MGT 4195 for both written and oral skills.

Result: 1 *Results of Capstone Course Oral Presentation*
 Not Conducted in 2007/2008

Method: 6 *Survey of Coop Student Employers*
 After completion of coop assignment, at least 90% of employers of MGT coop students will report these student workers meet or exceed expectations in communication skills. The data below cover the years 2004-2006.

Result: 1 *Results of Survey of Coop Student Employers*

Communication Area	About what we expected %	More than Expected	Much More than Expected	Total
Writing				
2006 Survey	36.9	41.5	21.5	100
Oral Comm.				

Action Summary: *Action Summary for Learning Objective Communication Skills*
 Action 1: The proportion of students reports high levels of preparation in formal oral communication skills has risen substantially, suggesting that no new initiatives are needed at this time. On the other hand, students graduating from the undergraduate program...

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Using classroom assessment data for program assessment: some considerations

- Unit of analysis: From course to program
- Agreement on outcomes, measures, criteria for success
- Requires coordination across instructors and courses
- Scoring involves more than one faculty member

Using classroom assessment techniques in program assessment has distinct advantages

- Authentic: Students are already being assessed as part of the course
- Flexible: Many different types of assessment can be used
- Transparent: Criteria for success clear to both students, faculty, and outside constituencies
- Other advantages?

Activity

- Given outcomes for your program:
 - Can you find linkages between your course and other courses (or program to other programs)?
 - Can you find linkages between your course and your program (or programs and campus strategic goals)?
 - How might your specific assessment activities inform your program or campus strategic goals?
 - How might you leverage assessment activities in the future to simultaneously serve courses, programs, and other institutional priorities?

See handout 4

Teaching and Learning Resources

- www.cetl.gatech.edu
- Western Washington University
 - <http://pandora.cii.wwu.edu/cii/resources/>
- League for Innovation in Community Colleges
 - <http://www.league.org/index.cfm>
- STEM education at University of Wisconsin
 - <http://www.cirtl.net/>
- Tomorrow's Professor
 - <http://ctl.stanford.edu/Tomprof/index.shtml>
- The Teaching Professor (subscription)
 - <http://www.teachingprofessor.com/>

Program Assessment Resources

- www.assessment.gatech.edu
- NC State University: Internet Resources for Higher Education Outcomes Assessment
 - <http://www2.acs.ncsu.edu/upa/assmt/resource.htm>
- Gen. Education Assessment Example at USC
 - <http://ipr.sc.edu/effectiveness/assessment/criteria>
- Assessment in Higher Education Listserv
 - <http://lsv.uky.edu/archives/assess.html>
- Eastern Illinois State Program Outcomes:
 - <http://www.eiu.edu/~assess/cahdap.php>

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- **Collect your feedback (see handout 5)**

Thank You!!!

Contact information:

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