Towards a culture of evidence
Part 1. Developing and writing learning outcomes
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o *"Assessment is an ongoing process aimed at understanding and **improving student learning**. It involves making our expectations explicit and public; setting appropriate criteria and high standards for learning quality; systematically gathering and analyzing, and interpreting evidence to determine how well performance matches those expectations and standards; and using the resulting information to document, explain, and improve performance."* Angelo, Thomas. American Association for Higher Education Bulletin *(1995): 79.)*

o *Assessment is the process of gathering and discussing information from multiple and diverse sources in order to develop a deep understanding of what students know, understand, and can do with their knowledge as a result of their educational experiences; the process culminates when assessment results are used to **improve subsequent learning***. *(Huba, Mary, and Jann Freed,. Learner-Centered Assessment on College Campuses: Shifting the Focus from Teaching to Learning . 2000)*

Assessment may mean different things to different people, but in the context of higher education the common denominator in all definitions is the purpose to which it is aimed at: **improving student learning**. For our present purpose we will not be talking about assessment that aims at improving a program, but rather as an ongoing conscious and systematic process that provides us with continuous feedback on the effectiveness of our instruction. As such, it would continuously take place as an integral part of our courses while we are teaching them.

With this in mind, we can simplify the process along the following three steps:

Assessment as continuous feedback = faculty and students focusing on learning	
1. Develop the learning outcomes	
2. Decide on the assessment methods and gather the information	Refine
3. Analyze the data, and use results to improve student learning	

Developing and writing learning outcomes

The most important starting point is to write learning outcomes (LOs) for each learning unit. They help our students identify their goals and help us "measure" the success of our instruction.

Simply put, learning outcomes should address the question *"What would students be able to <u>DO</u> at the end of the module, chapter or lecture that they could not do (or do as well) before?"*

In other words, the LO should focus on student performance rather than on something that is in his/her head like "know about…", "understand ..." or " appreciate …".
Statements such as "*Students will learn to appreciate what makes good theatre*" or "*Students will understand the role of gender and cultural differences in communication*" are not properly stated learning outcomes because they are not measurable.
Educators have developed a hierarchy of learning outcomes based on Bloom's taxonomy (1956)[1], which reflect increasing levels of complexity: **Knowledge, Comprehension, Application, Analysis, Synthesis, and Evaluation**

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[1] Huitt, W. (2004). Bloom et al.'s taxonomy of the cognitive domain. *Educational Psychology Interactive*. Valdosta, GA: Valdosta State University. Retrieved 25 Sep 2006, from http://chiron.valdosta.edu/whuitt/col/cogsys/bloom.html.

(although research has confirmed that the first four represent a true hierarchy, the hierarchical nature of the last two is debatable).

Each of Bloom's levels has a series of <u>action verbs</u> that describe what to <u>DO</u> at that cognitive level and can be very helpful when writing LOs. They are spelled out in the following table:
(From http://www.brookes.ac.uk/services/ocsd/2_learntch/writing_learning_outcomes.html)

Cognitive Level (↓)	**Knowledge** Define, describe, identify, label, list, name, outline, reproduce, recall, select, state, present, organize, recount, write, measure, relate, match
	Comprehension Interpret, translate, estimate, justify, clarify, defend, distinguish, explain, generalise, exemplify, infer, predict, rewrite, summarise, discuss, perform, report, present, indicate, find, represent, formulate, contrast, classify, express, compare, recognise, account
	Application Apply, solve, demonstrate, change, compute, manipulate, use, employ, modify, operate, predict, produce, relate, show, select, choose, assess, operate, illustrate, verify
	Analysis Recognise, distinguish between, evaluate, analyse, break down, differentiate, identify, illustrate how, infer, outline, point out, relate, select, separate, divide, compare, contrast, justify, resolve, examine, conclude, criticise, question, diagnose, categorise, elucidate
	Synthesis Arrange, assemble, organise, plan, prepare, design, formulate, construct, propose, present, explain, modify, reconstruct, relate, re-organise, revise, write, summarise, account for, report, alter, argue, order, select, manage, generalise, derive, synthesise, enlarge, suggest
	Evaluation Judge, evaluate, assess, discriminate, appraise, conclude, compare, contrast, criticise, justify, defend, rate, determine, choose, value, question, measure.

Ideally learning outcome statements should include an *action* verb that defines what the learner should be doing, the *context* in which s/he will be doing it and a *measurable performance criterion*. Two examples follow:

o *"Students should be able to carry on a conversation in French on a topic involving every day life (weather, shopping, dining, likes and dislikes, etc.) for five minutes without mistakes that disrupt communication"[2].*
o *"Given a case study on a scientific experiment, students should be able to identify the independent variable, the dependent variable, the controlled variables, the control group and the underlying assumptions of the study."*

Finally if we are to develop our students' critical thinking skills, learning outcomes should not come from the lower levels of Bloom's taxonomy but should include analysis, synthesis, and evaluation.

Our next New Chalk Talk issues will address "Formative Assessment and the Gathering of Information" and "Using Assessment to Improve Learning".

Sources

o *Angelo, Thomas . <u>American Association for Higher Education Bulletin</u> (1995): 79.*
o *Huba, Mary, and Jann Freed . <u>Learner-Centered Assessment on College Campuses: Shifting the Focus from Teaching to Learning</u> . 2000.*
o *Race, Phil . "Designing assessment to improve physical sciences learning." September 20, 2006 <http://www.physsci.ltsn.ac.uk/Publications/PracticeGuide/guide4.pdf>.*
o *"Writing learning outcomes: some suggestions". Oxford Centre for Staff and Learning Development. 7 Sep 2006, <http://www.brookes.ac.uk/services/ocsd/2_learntch/writing_learning_outcomes.html>.*

Share with us your experiences by contributing to the New Chalk Talk series,
or by simply sending comments/suggestions to *aellozy@aucegypt.edu*

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[2] "The Center for Innovative Teaching and Learning." The George Washington University. 25 Sep 2006 <http://www.cidd.gwu.edu/>.