Outcomes, Learning, and Assessment in General Education

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Background

After over 10 years of involvement in the assessment movement in higher education in the United States, it is my pleasure to be working as a Fulbright Scholar for 2008–09 with colleagues in the Office of University General Education (OUGE) at The Chinese University of Hong Kong (CUHK) on improving their General Education Program (GEP). I have been invited to share some of my thoughts on topics that have been of interest to me during the course of my career. CUHK has a long tradition of General Education (GE), and my efforts are directed at integrating the ideas mentioned below into an already strong program. With the shift in higher education to an outcomes-based approach, the emphasis now is on what really

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matters—learning. It is student-centered as opposed to faculty-centered. My purpose here is to describe the key elements in creating outcomes, the kinds of learning experiences that make sense to accomplish these outcomes, and some methods for assessing the extent of their attainment within the contexts of GEPs generally and of GE at CUHK specifically.

I was well along in my doctoral work in Educational Measurement and Statistics when the assessment movement began in the mid-eighties (Banta, 2002).[1] A decade later, it was just starting to gain momentum on my campus at the University of Wisconsin-Whitewater, perhaps an admission by the faculty and administration that they would not be able to "wait out" this educational "fad" because it seemed to have some "staying power." And staying power it has had. The combination of my own educational background and the engaging nature of the questions asked within an assessment context (i.e., to what extent have students achieved our outcomes?) contributed to my sustained interest in a field where often faculty and administrators serve their assessment sentence and then gladly move on. Asking these sorts of questions demonstrates that we sincerely care about an educational process that focuses on what students have learned.

Outcomes

Outcomes are the foundation of the assessment movement. During the course of my stay at CUHK, I have offered a number of seminars that have

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1   As described by Peter Ewell in Chapter One—"An Emerging Scholarship: A Brief History of Assessment." I have heard Peter speak on several occasions; his perspectives on assessment have certainly influenced mine.

focused on the development of outcomes at the program and course levels. The OUGE sponsors a series of seminars each year to faculty teaching courses in the GEP. Indeed, the language of outcomes is familiar to all of those who administer the GEP at CUHK, and, by degrees, faculty are using outcomes to guide learning. The course approval process developed by the OUGE requires outcomes to be articulated. By stating what we expect students to know and be able to do as a result of participating in our programs or enrolling in our courses, we are creating an environment in which learning and assessment can flourish. These three, outcomes, learning, and assessment, become integrated into a framework within which students can make the most of their collegiate and GE experiences, and faculty can think about their programs and courses from the perspectives of their students.

Given a mandate (and moving towards an outcomes-based approach was viewed in just that way by many faculty), the reaction is often to propose a new course. Suppose there is interest in having students grapple with ideas found in seminal readings on a certain theme. There is no shortage of creative titles for such courses. *The World of Ideas*,[2] developed as a capstone course in the GEP at UW-Whitewater, is one with which I am familiar. Its origins, in part, can be traced to a frantic effort to revise the GEP, instigated by the university's administration. Doing what they do best, the faculty developed courses like *The World of Ideas* primarily around the topics and texts that they enjoy teaching. Based on the readings used by some of the faculty on my campus, I would love to teach that course! However, the natural first step in an outcomes-based approach should be to develop some outcomes; courses

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2   Students cannot enroll in the course until their junior year. Some of the themes include "The Good Life," "Human Condition," "Community," and "Visions of the Future."

are merely vehicles to accomplish the outcomes. But at least one step (and perhaps two) should precede outcomes, starting with stating the goal of the program.

The goal of the program is a relatively brief description—a standard paragraph of six to eight sentences—of the guiding principles upon which the program rests.[3] It can, or should, be idealistic and, to some extent, abstract—tapping into the "soul" of the program. It should be stated in complete sentences so that the relationship among the ideas is clear. The last sentence should summarize what is most desired—an answer to those who might press for the single, most necessary result of participation in the program. This prescriptive and perhaps rigid approach is a way to distill the essential elements of the goal and to be consistent with the "less is more" principle, which is so important in an academic culture characterized by too much information and an inability to prioritize. Finally, it is unreasonable to think that developing a precise goal statement will be easy, but if the purpose is to offer a GEP that is on a strong footing, then the hours of debate and efforts towards consensus are, in my view, worth it.[4] Just this past fall, the goal of the GEP at CUHK was revisited and refined. Meetings that focused on further developing the outcomes for each of the four content areas that comprise a significant portion of the GEP were also held.

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3   I have often seen the "goal" of a GEP be expressed as a list of admittedly desirable characteristics—for example, that students will become critical thinkers or life-long learners. I would argue that such a list lacks the coherence that is possible in a well-written statement of the goal and is not particularly helpful in developing outcomes.

4   This process can sometimes have an almost paralyzing effect on efforts to devise and deliver a GEP. Remember that the goal statement can be revised in the future but must be sufficiently well-developed so that the GEP moves forward with the enthusiasm and commitment that will likely follow if the goal truly captures the essence of the GEP.

I had previously participated in discussions of this nature, and knew that progress can be slow, especially in the early stages. A colleague and I offered the metaphor of thinking in geologic time (or perhaps like the pace at which glaciers move) when it comes to getting faculty to arrive at a consensus when developing the goal of a GEP. Perhaps one way to move deliberations along is to discourage faculty from talking about the courses that they teach—an indication that the new program would be well served if only it could be molded around the courses that already exist. Developing a new program should commence with a goal statement that reflects deeply held educational values. It means transcending our desire to repeat what we do best—teach courses—and focus on the learner. What is our goal for the learners who will participate in our program? Answering this question does not come naturally to faculty and certainly changes the vantage point from which we view our activities in the classroom.

So what are some worthy goals of a GEP? I am interested in this question to some extent, but find that dealing with the pedagogical and assessment challenges inherent in the goal, whatever it is, to be sufficiently demanding. Much of my career has been spent consulting with a wide range of programs and departments on assessment-related issues. Generally, I regard faculty to be the highest authorities in their respective disciplines, and they are in the best position to articulate the goal for their majors or programs. This is also a matter of ownership, an issue that is admittedly more problematic in a GEP than in individual departments (Stone & Friedman, 2002). In my experience, administrators will defer to the faculty on these matters, as well they should. Their concern is with the existence of a goal, not its

substance. Still, the following are some characteristics that might constitute a strong GEP:

Culture: One of the important elements that I have noticed since coming to CUHK is an emphasis on culture. It strikes me that exposing students to the roots of their own cultural heritage is a worthwhile outcome for a GEP. At CUHK, students must complete credits in each of four broad areas, the first of which is Chinese Cultural Heritage. The others are Nature, Technology, and the Environment; Society and Culture; and Self and the Humanities. But the program does not stop there. Starting in 2012, all students will enroll in a six-credit Foundation Course, built around classic readings in the humanities and sciences. As a result, while students might discover some unique issues related to their own culture, they will also find that some of the problems faced by humankind are perennial and have been considered by great thinkers of the past. Their ideas form a strong basis for developing a more personal perspective.

Strategies and Judgment: It is to be hoped that a GEP will develop a generalist as opposed to a specialist. However, students should learn enough about a range of disciplines to see that each is characterized by a specific knowledge base and problem-solving strategies—strategies that might well prove useful as their lives unfold. For example, pre-medical students should learn that philosophers have their own approaches to solving problems that might be of value—especially in an area like ethics. Designing experiences that result in the development of practical judgment might be another important dimension of a GEP. Sullivan and Rosen (2008) offer this construct as a bridge between liberal and professional education. It is not enough to prepare master technicians but rather citizens who can exercise judgment

when it comes to their own civic responsibilities, environmental stewardship, and so on. GEPs should also inspire students to see themselves as always unfinished, and that there is always more to learn.

Teamwork: One of the facets of the GEP housed in some of the Colleges at CUHK is a capstone project—a Senior Seminar. Like the Foundation Course, this course helps insure a commonality of GE experiences. Here, students work in teams, each with members that cross a spectrum of majors, to produce a written project that will be presented orally to peers. One of the complaints often heard in a range of employment settings is that workers lack the skills necessary to be part of a team. Finally, the Colleges at CUHK have developed a number of "informal" learning opportunities for students. These include listening to speakers on a range of topics and completing projects with peers. These experiences are designed to instill a sense of collegiate pride and the realization that learning can occur both inside and outside of the classroom.

Thus, my ideal GEP results in students who can make practical judgments using a range of problem-solving strategies. They are firmly anchored in an understanding of their own culture but appreciate the contributions from others, value learning across their entire lifespan, and are able to work effectively with others. Certainly there are other dimensions not listed above (perhaps arguably more important ones). However, after watching from afar recent events that have unfolded in the United States (the demise of several bulwarks of the financial sector, the continued waging of the war in Iraq, rising unemployment, and the mortgage crisis), I am convinced that emphasizing the ability to use practical judgment will be of paramount importance for tomorrow's citizens, and it is the cornerstone of my ideal GEP.

I have often seen departments and programs put forth an overly ambitious goal, and following the process outlined above will help avoid this problem. It is important to remember that it is much harder to focus our thoughts than to expend the words necessary to capture diffuse thinking.[5] A clear, concise goal will positively affect efforts to actually operationalize it with meaningful outcomes, learning opportunities, and assessments.

Ultimately, the goal of a GEP must be translated into statements that are less idealistic and represent clear pathways towards learning and assessment. I espouse a sequence where the overall goal of the GEP is followed by objectives (an optional step)[6] and, finally, by outcomes. Gronlund and Brookhart (2008) offered this approach to classroom teachers. They believe that teachers should begin by articulating their vision for a course (the goal). They should then develop general instructional objectives that are clearer than the goal but still somewhat vague—that is, "Students will understand . . ." or "Students will appreciate . . . ." Finally, specific learning outcomes should be stated that capture what students will know and be able to do in measurable terms—that is, "Students will recall[7] . . . ," "Students will explain . . .," or "Students will judge . . . ." The verbs provide a directive for not only how the outcomes should be taught, but also how they can be assessed. For a list of verbs and phrases for each level of the Bloom Taxonomy for the

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5   A quotation is attributed to Blasé Pascal to the effect that he would have made a letter to a friend shorter, but he didn't have the time.

6   Objectives are characterized by verbs like "knows," "understands," and "appreciates," which can help to make the goal more concrete, thus making the statement of outcomes easier. They can serve as an intermediate step that precedes outcomes, although outcomes can, of course, emanate directly from the goal.

7   "Recall" is a commonly used verb to describe a rudimentary use of knowledge. Other verbs for this level include: choose, define, describe, label, list, locate, match, memorize, name, omit, record, relate, repeat, and select.

Cognitive Domain,[8] see Gronlund and Brookfield.

Outcomes precisely identify what students will know or be able to do as a result of participation in a GEP. Erring on the side of fewer outcomes rather than more will have a positive effect on the process (which also makes the development of learning experiences and assessments more manageable). In addition to specific verbs, outcomes can also be described by proposing key statements or questions to which students might respond as evidence that the outcome has been achieved. These are particularly useful for the higher levels of thinking in Bloom's Taxonomy and serve as a guide for teachers who are interested in developing classroom activities that demand certain kinds of thinking. For example, in order to demonstrate that students can think at the second level of the Taxonomy (comprehension), they might be asked to provide an example that illustrates that they can do more with a piece of information than simply memorize it.[9] The specific verbs, statements, and questions help determine the precise wording for an outcome that is being considered and define the nature of the assessment that can be used to measure it. I have my own version that I have circulated widely at CUHK and whenever I speak on this topic (see Appendix I).

8　Based on the work by Benjamin Bloom in the 1950s that was not noticed much at the time, his taxonomy is a key to conceptualizing outcome-based education. It consists of six levels—knowledge, comprehension, application, analysis, synthesis, and evaluation—that represent increasingly more sophisticated levels of thinking whereby a relatively high level of thinking is not possible unless the levels below it have been mastered.

9　Other statements and questions for the comprehension level include:

Give an example of . . .	State in one word.
Condense this paragraph	Explain what is happening.
State in your own words.	Explain what is meant.
Show in a graph or a table.	Read a table or a graph.
Select the best definition.	Which statement supports the main idea?
Is this the same as . . .?	What does this represent?
What restrictions would you add?	What part doesn't fit?
What exceptions are there?	Which is more probable?
What are facts? Opinions?	What does it mean?

Outcomes allow us to take our most grandiose goals (to which faculty seem to gravitate) and render them learnable and assessable. Faculty might not believe evidence that mastering the parts insures the same for the whole. In fact, most faculty I know recoil at the idea. Many are quick to point out that the mosaic of a student's experiences in one of their courses likely results in serendipitous effects that can hardly be predicted, let alone measured—effects that will certainly vary from student to student. In fact, this line of thinking is often used as an argument against an outcomes-based approach. While these ideas resonate to some extent, what seems more reasonable is using outcomes as a way to think seriously about how we can make it more likely that students will experience both the anticipated and unanticipated rewards of participating in our programs or taking our courses.

Learning

It is to be hoped that the majority of the outcomes for a GEP will push students into the higher levels of Bloom's Taxonomy.[10] The key observation here is that if teachers' aspirations for their students go beyond the knowledge level, then something beyond the traditional[11] lecture method must happen in the classroom. Anything resembling a complete list of teaching techniques is beyond the scope of this paper. However, based on my own experience in the

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10 Again, it is important to remember that the higher levels of thinking require the mastery of the lower levels. Thus, even the lowly level of knowledge is important and should be viewed as the gateway to the higher levels of thinking that many faculty wish to feature in their classrooms.

11 I am thinking about a setting where the teacher is simply presenting information and perhaps asking the occasional question. As will be seen, lectures can be enhanced with activities that promote deeper learning.

classroom and my work in faculty development, I will present some examples that illustrate how the kind of learning that we desire in our classrooms can occur. Other Fulbright colleagues and I offered several seminars at CUHK devoted to this topic, including active learning, using technology to enhance learning, and the scholarship of teaching and learning.

Over the course of my own career, one of the courses that I taught was required for students in our teacher preparation program: Measurement and Evaluation in the Secondary School. My students were primarily undergraduates who had not taught previously, plus a few who already had a bachelor's degree and were returning for their license to teach, but who, again, had no teaching experience. Such a course is rarely required in teacher preparation programs; these topics are often only covered in a cursory manner in a course in educational psychology. As outlined above, my first step was to state an overall goal for the course in a single sentence. The goal has changed over the years, and the current version is as follows: When they become teachers, students will be able to use the ideas presented in the course to help their students learn and to grade them fairly.

There is an immediate pitfall in the goal—"when they become teachers . . . ." But I believe that all teachers face this issue to some degree because the substance of our interactions with students tends to anticipate the knowledge and skills that they will need in the workplace, the communities where they will live, and so on. The idea of testing and grading lacked immediacy for my students; after all, they had no students of their own to test and grade. I have often thought that students should be taking my course in the evening during their first year of teaching, when perhaps what I had to offer would be more relevant. Regardless, guided by my goal, I organized the course

around the outcomes that would aid in accomplishing it. For example, one of my outcomes was that students would be able to write outcomes. I cannot imagine a course in measurement and evaluation that would not begin with outcomes, as evidenced by the textbooks commonly used in this course. [12]

A good bit of thought was invested in articulating the above outcome. I was convinced that my students needed to be able to do more than simply memorize the definition of an outcome. They needed to be able to do more than explain the concept (moving towards the higher levels of the Bloom Taxonomy). Even the ability to apply this concept in their teaching would fall short. What they needed to be able to do was actually write outcomes. This would involve synthesizing what they knew about outcomes and then creating them. There was no guarantee that my students would ultimately carry this ability into their classroom; a number of factors beyond my control would determine that. But what I could control were my thoughts about my own teaching and my attempt to take my relatively ambitious goal for my students and render it potentially achievable by articulating outcomes.

It is unlikely that lecturing to students will prepare them to write outcomes. This outcome has implications for my students and what they are expected to learn, but the outcome also implies that the teacher will create a classroom environment in which students can function at the level of thinking specified in the outcome. Thus, activities must be designed so that students can practice the skills prior to being held accountable on an examination or project. If we expect students to achieve outcomes towards the higher end of

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12 Well before the idea of outcomes became popular in higher education, measurement specialists like Gronlund dealt with this topic in an early chapter of his text. His text (currently with Miller and Linn) is in its 10th edition and is still widely used.

Bloom's Taxonomy, then our teaching methods (and assessments) must be synchronous with them. In this case, classroom activities must be designed around opportunities for students to write outcomes. In the past, I have used the chapters in our own text as fodder for outcome development.[13] Since my students were from a range of disciplines, I was also able to structure some group work around writing outcomes. For example, the three or four history majors were provided with a text used for a United States history course taught in secondary school. Their task was to write four or five outcomes for one of the chapters. However it is executed in the classroom, an outcome at the level of synthesis demands that teachers provide concomitant opportunities for students to practice that level of thinking.

The most important concept here is that of matching learning experiences to the intended outcome. This is especially important for outcomes beyond the knowledge level. Somehow, if students are expected, for example, to learn how to apply a concept, then they must be able to practice doing so. Currently, these approaches fall under the aegis of "active learning" (Bonwell & Eison, 1991), which is based on the concept of discovery learning (Bruner, 1961). The idea is to plan activities where learners interact directly with the content. One example that is a variation on the traditional, large-class discussion (itself an active learning strategy) is to pair students, giving them a minute or so to think about the lesson that might have just ended. Next, they share their thoughts with their partners and then finally reconvene with all of their peers for a formal discussion, during which time the instructor clarifies

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13 After students write outcomes, they might also be required to develop test items that are incorporated into an end-of-unit or other summative assessment, thereby accomplishing another outcome for the course.

any misconceptions. At least on the surface, students are more engaged in the material than if they had just been listening to the professor lecture. Bonwell and Eison have argued that the difference is one of substance rather than just appearance. My own experience confirms their argument.

These approaches place the onus of learning on learners. I once saw a cartoon to the effect that school was a place where kids go to watch adults work. As I finished many a lecture early in my career, I felt intellectually drained while my students appeared to hardly "break a sweat." In some ways perhaps it is simply easier for us to lecture to students; after all, we know the content so why not simply pass along our knowledge to them in the most efficient way possible? But what makes more sense is engaging students in classroom activities that will make it more likely that they will be able to use knowledge beyond having memorized it. Teachers are fond of making statements like "In my class, students will learn to think." Well then, let's make a more concerted effort to make that happen. This is not to say that a well-delivered lecture cannot prompt thinking, even at some of the highest levels of the Bloom Taxonomy, but it is incumbent on faculty to seriously consider how to better use class time so that students are the ones who are intellectually drained because they have been actively involved with the content.

There are other active learning strategies that are sometimes presented as assessment techniques. Technology has made it possible to engage students in ways that yield useful classroom assessment information and high levels of active learning. "Clickers" are used by many faculty as an efficient way to monitor student learning and provide immediate feedback. At various points during a lecture, a multiple-choice question is projected onto a screen visible

to all. Students are given a few seconds to consider their responses and then send them to a receiver by clicking their choices on a hand-held, electronic device. The responses are then displayed and discussion follows. If the questions are designed using common misconceptions as possible choices, then, based on response patterns, the teacher can instantly provide further explanation. Research evidence is starting to emerge that demonstrates the efficacy of clickers, though the meta-finding for studies on the impact of technology has generally supported the null hypothesis when compared to traditional instruction (Yin, Urven, Schramm, & Friedman, 2002).

A number of less technologically advanced (but still highly effective) active learning/assessment techniques have been presented by Angelo and Cross (1993). Probably the most widely used of these is the "Minute Paper." Minute papers are often used at the end of a class, although they can be introduced at any time during the instructional process. Directed to use concise, well-planned sentences, students are asked: 1) What is the most significant (central, useful, meaningful, surprising, disturbing) concept that you learned in class today? 2) What question(s) do you have? Note cards (3"x 5") are great for this purpose. What was learned can be written on the front, while the question is written on the back. They are collected as students leave, and instructors can peruse the contents in a few minutes. Key findings from the cards must always be shared at the next class (or perhaps even sooner if the students are available in an online chat room) and often set the stage for the next class. Another option is to immediately circulate the cards among groups of students, who then tabulate, analyze, and report the results to the entire class. This is but one of many classroom assessment techniques described by Angelo and Cross in their book.

While clickers and minute papers are often discussed within the context of assessment, they can certainly be construed as active learning strategies and are good examples of formative assessment. While all assessment involves learning, formative assessment is particularly suited for this purpose. The results of clicker responses and minute papers are never included in the data used to assign grades. Besides, these results are anonymous (as they should be). The idea is to give students the opportunity to interact with the content of the course in a way that informs them of their progress (or lack thereof). Of course, the instructor, who is privy to the results for the group, can adapt lessons to the needs of the learners based on these formative assessments. Students now have a powerful learning tool that can be used to directly inform them of their strengths and weaknesses as the course unfolds and provide an opportunity for them to learn from their mistakes without any penalty.

Courses do come to an end at some point, and final grades must be assigned. This is called summative assessment[14] and should be based on formal tests, projects, and assignments. Here, the quality of the data is much more important than it is in the case of a formative assessment. Assessment specialists (like Miller, Linn, & Gronlund, 2008) discuss the technical features of such assessments in terms of the evidence that supports the valid use of data and evidence that a set of scores is reliable. Validity and reliability are a matter of degree, and teachers use this information to justify that the grades that they assign are based on data of reasonably high quality. There are no

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14 The concepts of formative and summative assessment have a long history in the field of assessment. Unfortunately, too few teachers provide opportunities for formative assessment where the focus is purely on learning. While summative assessments are also opportunities to learn, the stakes are much higher, and the opportunity for students to adjust their learning strategies or faculty their teaching has passed.

such considerations in formative assessments; the stakes are low and the sole purpose is to provide feedback so teachers can help improve learning. Thus, the two kinds of assessment—formative and summative—serve decidedly different purposes and should never be confused.

This section on learning began with the hope that outcomes for any class would be heavily weighted towards the higher levels of thinking in Bloom's Taxonomy. This is the realm in which learning starts to get interesting for the student (and the teacher). Active learning comprises a number of techniques whereby students are more fully engaged with the content of the course—as participants in the educational process as opposed to spectators. This discussion moved into one about formative assessment (and the seminal work of Angelo and Cross) and summative assessment. Many of these ideas will reappear, though perhaps in a slightly different form, as I turn my attention to assessment within the context of GEPs.

Assessment

As described above, outcomes for a GEP should be developed in concert with the stated goal of the program, but even if outcomes are not assessed, surely students have learned something, right? But what have they learned? Faculty might implore us to trust them. There is a saying in assessment circles: "In God we trust; everyone else bring data."[15] This is perhaps an overstatement, but why should those who financially support higher education (or anyone else, for that matter) put that kind of trust in

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15   The phrase, "In God We Trust," appears on all United States currency and coins.

faculty? Why would faculty even ask for such trust? Of all the stakeholders in higher education, it seems to me that faculty would be the first to desire some kind of evidence that students are achieving the outcomes of the program. Without such evidence, any path towards improving the program often meanders depending upon the current politics in a program or the pieces of the curriculum that faculty have staked-out for themselves. What is needed is a systematic approach to introducing feedback into the program. What is needed is program assessment.

I once attended a conference where a well-known authority on assessment said something to the effect that if the grades we assigned to students meant anything, the assessment movement would have never happened. He was referring to evidence of the erosion of standards in colleges and universities in the United States, which prompted some of the earliest calls for more accountability in higher education. Some of my own research findings and reading on how teachers test and grade students, grade inflation, and ethical issues in grading support his observation. More importantly, the grades assigned in individual courses capture the performance of individual students, not how groups of students performed in a program. Thus, regardless of our individual biases towards testing and grading in the classroom, it is clear that the assessment of programs serves a dramatically different purpose.

Assessing educational outcomes can be a chore—at least that is the perception of many faculty members. Assessment within the context of a GEP can be especially problematic, as discussed by Stone and Friedman (2002). They list five lessons they learned on their campus:

1.   When assessment is made a part of a new curricular program, assessment data are more likely to drive the development and revision of courses.

2. GE assessment is difficult to design and implement because a general education curriculum belongs to everyone—and to no one.

3. Faculty construe academic assessment not as part of their normal instructional and/or curricular re-design responsibilities, but rather as an "above load" activity.

4. GE assessment is the product of a variety of external and internal constituencies, and these constituencies impel and constrain the process of general education assessment at different times and in different ways.

5. When it comes to implementing change with complex and far-reaching initiatives like general education, it is prudent to think of "academic time" in terms of "geologic time."

When assessment is imposed on existing programs (and many institutions already have GEPs), it becomes more difficult to make assessment part of institutional culture. GEPs differ from departments that house specific disciplines.[16] This often results in an ownership problem that can impede assessment. In GEPs (and other situations where assessment occurs), it must be demonstrated that assessment is not an "add-on" but something that can be systematically and incrementally integrated into the program. It is true that programs can feel like puppets on strings being tugged by accrediting agencies, for example. However, if the outcomes of the program are aligned with those of accreditation (and why would not they be, assuming accreditation adds value to the program), then both masters can be served. Assessment of GEPs, especially when designed for established programs, can take time, but

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16   Those interested in assessing outcomes within the context of the major should see Friedman (1995).

the resulting information can dramatically improve the quality of the program in the long run.

Perhaps the most crucial observation here is that it is far easier for individual departments to develop outcomes, especially if an accrediting organization is assisting in defining them. For example, in the United States (and worldwide), business colleges are accredited by the Association to Advance Collegiate Schools of Business, which carefully defines outcomes. There are no comparable outcomes for GEPs, although a perusal of the literature will indicate that there is much agreement across institutions when it comes to GE outcomes. However, this matter of ownership often exists given the range of faculty and departments that typically deliver the GEP. Still, assessment can flourish, so long as measurable outcomes have been delineated.

In the end, outcomes must be matched to assessments, which can be accomplished in a variety of ways. Gathering students' perceptions of what they have learned is a fairly straightforward process. Typically, Likert-type scales are employed where students respond on continuums with perhaps "Strongly Disagree" at one end and "Strongly Agree" at the other. Students may or may not respond honestly, depending upon the circumstances surrounding the administration of these types of instruments. Even if truthful, are students in a position to offer meaningful feedback? Can they fairly assess the degree to which outcomes have been achieved? Without changing the source, gathering such data sometime <u>after</u> the student has graduated adds another dimension to what can be learned, since students can now view their educational experiences against the backdrop of the demands of their jobs and social interactions. How often have students at all levels gone back to

thank teachers years later for efforts that were likely not appreciated (at least not in the same way) at the time?

Perception data are even more useful when they come from those who subsequently interact with graduates. Using similar kinds of scales, employers, for example, can provide a unique perspective on the extent to which outcomes have been achieved. For example, an employee's ability to work effectively in a team could easily be appraised using this approach. Gathering supervisors' perceptions in internship settings is similar. These sources of data can be particularly useful in assessing the effectiveness of instruction in the major, although GE outcomes can also be included. Employers and supervisors are in a position to offer a perspective that should be of interest when determining the extent to which the outcomes of a program or major have been achieved. This means taking a longer view of assessment, realizing that while some outcomes can be evaluated immediately, others will require the passage of time to assess in a meaningful way.

Standardized assessments begin a range of options that address something far more interesting than students' perceptions—that is, what they actually know and/or are able to do. Instruments like the Collegiate Assessment of Academic Proficiency[17] can be used within the context of GEPs, although inducing students to take such tests seriously can be problematic, because they are often administered apart from a specific course. I was once involved in a plan to administer such an examination that was a complete disaster. After ordering hundreds of expensive protocols from the publisher and

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17 This standardized examination is published by the American College Testing Company. It measures basic knowledge and skills and is primarily intended for use with college-level students.

offering several enticements, only a handful of students actually came to take the test (and even their performance was suspect). There was really no reason for them to care about the assessment, because it was tied to a part of the curriculum that inspired few of them (somewhat typical, I believe, of how students view GE). In addition, the assessment only vaguely matched the outcomes of our GEP.

This is not a problem when students sit for, say, the examination leading to becoming a Certified Public Accountant (CPA). A high pass rate communicates a great deal about the extent to which students have accomplished the outcomes set forth by the Accounting Department at a university. Likewise, the results for Graduate Record Examinations for a group of students entering graduate school from, for example, a Department of Psychology can provide evidence that students are achieving desired results. In both cases, departmental outcomes have hopefully been shaped by the outcomes implicit in the examinations. For the Accounting Department to deliver a program with no thought of what is on the test to become a CPA would be ludicrous. If departmental and professional outcomes are aligned, then tests like the CPA examination indicate that the outcomes have been achieved. Standardized tests are designed to meet the needs of a large number of programs and are often national (sometimes international) in scope. How much more interesting would it be to use instruments that assess the extent to which local departmental or programmatic outcomes have been achieved?

This can be done using assessments that are imbedded into the actual courses that comprise the GEP. I have worked with a wide range of departments on these matters; perhaps the best example I can offer is from the Department of Biological Sciences at my home university. One of the outcomes of our GEP focused on an understanding of the scientific method. After setting up

a chart where courses occupied one axis and outcomes the other,[18] it was determined that the Introductory Biology course (A laboratory science was one of the requirements of our GEP, and most students chose this course.) would be a logical place to imbed an assessment that would provide evidence of the extent to which this outcome was being achieved. Early results indicated that while students seemed able to identify key features of how problems are solved in the sciences, they were much less able to think like scientists when confronted with a novel problem. These results were based on ten multiple-choice items that were included in the final examination in the course and were analyzed across all sections so that individual students and instructors remained anonymous.[19] The passage and last three items follow:

Since the 1940's antibiotics have been widely used for everything from fighting infections to helping increase the weight of cattle. Recently, health workers have found that strains of bacteria that at one time were susceptible to antibiotics have become resistant to many classes of antibiotics. Diseases such as tuberculosis and gonorrhea that were under control and treatable are making a comeback. Research shows that there are a number of different types of resistance to various antibiotics. For example, some bacteria in a population might have enzymes that destroy the antibiotic penicillin while others of the population do not. Some bacteria might have a ribosome that differs slightly in shape from most of the bacteria of a population and therefore be resistant to streptomycin. Some antibiotics work by breaking down

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18 For pre-existing GEPs especially, this is an extremely useful exercise that can sometimes reveal curricular flaws—that is, insufficient coverage of some outcomes and over-coverage of others.

19 This is a key feature of program assessment. The focus is on the *program*, not individuals. If there is interest in evaluating individual faculty, then departmental, college, and university procedures are likely already in place.

the cell wall of bacteria. If some of the bacteria in a population have a slightly different structure in their cell wall, then they would be resistant to that class of antibiotics. This variation among individuals of a population allows some to survive while others are killed. Since the shape of the cell wall or the presence or absence of the penicillin-destroying enzyme is genetically controlled, the daughter cells of the resistant bacteria will also be resistant. The improper use of antibiotics frequently leads to an increase in the number of resistant bacteria in patients. For example, if a patient takes antibiotics to fight an infection but decides to stop the medication when he feels better instead of taking the entire prescription, he may experience a relapse of the infection. But this time the infection will be resistant to the antibiotic.

8. An increase in the number of bacteria that are resistant to antibiotics is due to

    a. random genetic drift.

    b. natural selection.

    c. the Hardy-Weinberg principle.

    d. None of the above

9. In nature many types of bacteria, fungus, and other organisms compete. The antibiotics we use are actually derived from these organisms. One type of organism will develop the antibiotic; the other will develop a counter measure. This is known as

    a. co-evolution.

    b. selection of the fittest.

    c. selective advantage.

    d. stabilizing selection.

10. For evolution of resistance to occur in bacteria, which of the following factors would be necessary?

    a. There must be resistant bacteria in the population.

    b. The bacteria must be exposed to new factors in the environment to cause a change in their cell walls.

    c. Bacteria species must differ from each other.

    d. Cell wall structure must be determined by environmental conditions.

The items follow a form described by Miller, Linn, and Gronlund (2008) called an interpretative exercise. The idea is to write a passage and test items that students have not seen previously. Of course the content was taught in class, using different examples. The exercise determines if students have developed the ability to think like scientists—that is, whether they can apply what they learned previously to a new situation. Writing such passages and items is labor intensive, but if kept secure they can be used in subsequent semesters. Selected-response items can be continuously improved using item analysis.[20] Indeed, the data from the inaugural administration of the assessment formed the basis for many lively discussions among the faculty who taught the course as they asked themselves: What can be done to improve the ability of students to think more like scientists? If methods to better teach students this skill are subsequently incorporated into the classroom, future administrations of the items should confirm their effectiveness. Trends over time are especially useful within an assessment framework. Unfortunately, many assessment efforts are not sustained.

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20 Item analysis is best used when answer sheets can be scored by optical scanners. The key indices are difficulty and discrimination, which are represented as coefficients for each item and translate into measures of item quality. A full discussion of item analysis can be found in standard assessment texts like Miller, Linn, and Gronlund (2008).

Capstone projects represent an especially good opportunity to assess student performance in a GEP. If an in-class presentation is required, there is potential to incorporate scores on the performance as well. Alverno College[21] is a recognized leader in assessment in the United States. There, panels of judges from outside the college are recruited to evaluate the students' final presentations. The results are compared to a presentation done at the beginning of the student's career, thereby providing a powerful assessment of what the students have gained over the course of their collegiate experience. This is also a point where students, having completed the GEP, might be tapped for their perceptions, perhaps utilizing focus groups, although such data hardly match what can be learned when actual performance is assessed.

Pre-/post-test assessments are other options; however, when comparing distributions of such scores, it is important to remember that pre-/post- scores have notoriously low reliability coefficients. This is largely because much of the variation exposed by the pre-test is duplicated in the post-test scores. Also, the timeframe separating the two is important: the shorter the time between administrations, the more prone the scores are to memory effects and so forth. That said, assessment data need not be held to the same high standards as data gathered in other research settings. For example, if data are being used to select candidates for special training (and some are rejected), then the scores must be highly valid and reliable. However, no such monumental decision is being made when assessing outcomes; rather, data are being used to cast a spotlight on areas of programmatic weakness. New data will function similarly as the cycle of improvement is repeated.

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21 Go to alverno.edu on the Internet for more information about their approach to assessment and publications.

Once assessment information is gathered, it must become feedback and reach all interested constituencies: faculty, students, and all stakeholders. If students know that information is being used to actually improve programs, they are more likely to participate in the process. Faculty members will often engage with colleagues in discussing results when offered the opportunity. In mounting an assessment effort, it is important to reiterate that it is unreasonable to expect that assessment data will reach the standards in place for, say, a medical research study, where the quality of the data might truly be a matter of life or death for patients treated based on the results of the study. The stakes in program assessment settings are really quite low by comparison; the data are used to improve the program only. Besides, good program assessment schemes are ongoing so that the process of continuous improvement is uninterrupted. If particularly skewed or biased data happen to be gathered in a given year, subsequent data gathering efforts will likely be less so. Again, the stakes are relatively low, and it is far more damaging to the program to be paralyzed by the attempt to gather impeccable data than to proceed with a reasonable plan. As trends emerge over the course of several years, suspect data will be fairly obvious.

The assessment of the GEP at CUHK is in its early stages. At this point, students' perceptions about the extent to which GE outcomes have been achieved have been gathered in some courses. Two sections of the new Foundation Course are being piloted in the current semester, and information will be collected that will make it possible to contrast student performance at the beginning of the course with that at the end and potentially with that in the Senior Seminar as students complete the GEP. Assessing actual learning is of the greatest value when trying to improve a GEP, and the OUGE has ambitious

plans to work towards that end. One of my goals is to help develop a master assessment plan in which all GE outcomes are assessed systematically and periodically at CUHK.

Many of the assessment strategies that have been described are at least somewhat intrusive in the classroom, and faculty often cite this as a reason for concern. Integrating assessment and the curriculum represents a way to address this concern. Building on the writing assessment effort at my campus, Lencho, Longrie, and Friedman (2009) devised a way to accomplish this. This method is described in the next section.

Integration of Curriculum and Assessment[22]

Several events shaped an assessment approach and teaching methods that resulted in a process that is honest, pedagogically sound, and aligned with the curriculum. By degrees, the assessment of writing in the GEP at the University of Wisconsin-Whitewater became closely aligned with course curricula, at least in one instructor's courses—English 101 (101—a composition course typically taken by freshmen) and World of Ideas (WOI—the GE capstone course that requires junior status).

The current GEP at UW-Whitewater, which was initiated in the mid-1990s, represents a much more prescriptive curriculum than prior to that time, when students were allowed to choose from a wide variety of courses. Three of the nine outcomes, developed to embody the primary goal of the GEP, could be assessed using student writing:

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22 The following section is based on an article that has been accepted for publication, and has been modified to fit the current context. Of course, I am indebted to my co-authors, Mark Lencho and Michael Longrie.

1. Think critically and analytically, integrate and synthesize knowledge, and draw conclusions from complex information.

2. Make sound ethical and value judgments based on the development of a personal value system, on an understanding of the cultural heritage that students share, and a knowledge of past successes, failures, and consequences of individual roles and societal choices.

3. Communicate effectively in written, oral, and symbolic form with an appreciation of aesthetic and logical considerations in conveying ideas.

Initially, we planned to rely heavily on standardized assessments, but due to problems encountered when trying to administer these tests as described earlier, we moved in the direction of course-embedded assessments.

In 1999, three faculty members from the Department of Languages and Literatures were recruited to develop the procedures and instruments necessary to evaluate a set of papers from the WOI course—papers of 1,500–2,500 words in length that were assigned by all instructors as the culminating project for the class. A rubric was developed around three criteria—thinking, voice, and literacy—which were articulated in such a way as to link directly back to the GEP outcomes listed above.

A six-point scale was used for the criteria: 6=Outstanding, 5=Strong, 4=Adequate, 3=Limited, 2=Seriously Flawed, and 1=Fundamentally Deficient. The initial design involved scoring a randomly selected set of papers across all sections of WOI. However, few instructors were supportive of the assessment, so the first sample consisted of 38 papers that had supposedly been selected at random by four or five WOI instructors whose names (and those of the students) had been removed by personnel in the dean's office of the College of Letters and Sciences. The three faculty members also served as

readers and achieved an alpha coefficient of .78 for this first batch of papers. Overall, the scores fell between "limited" and "adequate."

Over the next three years, additional sets of papers were scored. Papers from 101 were gradually included to gauge improvement from freshman to junior year. These writing assessments did not spawn any systematic attempts to improve student writing, despite the consistent characterization of junior-level writing as somewhere between "limited" and "adequate," and freshman writing between "seriously flawed" and "limited." This began to change in the fall of 2004 with the resurrection of a "Writing Across the Curriculum" committee, which years ago had been instrumental in designating certain courses as "writing intensive." Colleagues from the University of Wisconsin-La Crosse presented two workshops on campus entitled "Writing Across the Major." Our Department of History redesigned the major so that writing was systematically dispersed throughout the program. Assessment results appeared to be engendering some action.

The next round of writing assessments continued with the inclusion of both 101 and WOI papers. Again, one instructor, who taught both classes, agreed to share the final papers that were written on the topic of a public person that the student most admired. The assignment of the WOI students was couched within the individual citizen's relationship to the State, a core feature of the human condition and a theme in the WOI course. It is fair to say that the curriculum in WOI was more conducive to the assignment than that of 101. We mixed a sample of the final papers from both classes, which represented a great improvement over past efforts to compare 101 and WOI because now, at least at face value, the papers looked the same and were written on similar themes. The scores showed some improvement, with the

WOI papers now solidly in the "adequate" range and 101 in the "limited" range. However, three new raters were added to the three original raters. Despite efforts to calibrate all of the raters before the papers were scored, the new raters tended to score papers higher than the original raters. Still, when looking at the scores assigned by the original raters, the scores of students in both 101 and WOI had improved.

The culminating iteration relied on a single instructor who taught both 101 and WOI and was interested in designing the curriculum in both classes so that students would be supported in developing their final papers on the same theme: the person that the student most admired. The results were fairly consistent with those of the previous year. Moreover, due in part to further calibration of the raters, the scores between the new raters and the original raters showed greater agreement. Below are descriptions of the two writing scenes that were developed:

Scene 1: 101

First-year students were provided with the following prompt with no preparation on the first day of class:

Write a developed, thoughtful, short response (200–300 words) to the following:

Identify and discuss the public figure you most admire. You may select a living person or a historical one. For what reasons do you admire this person? Further, explain how this person's private character and virtues are a fine model for public values. Provide reasons/examples. Use the reverse side of the paper if needed.

This exercise had two specific goals. The first was to serve as a diagnostic sample (common in writing courses) of each student's ability to generate prose, stay on topic, argue a position, provide reasons and supporting evidence, and so forth. The instructor can then identify specific student needs (for example, tutorial assistance for individuals) and also areas of writing instruction that need emphasis. Second, the prompt introduces the subject of an admired figure, which is revisited and more fully delineated as the final project of the semester:

> For your final paper, I ask that you address the issue that you encountered in the first week of class. Identify and discuss the public figure you most admire. You may select a living person or a historical one. For what reasons do you admire this person? Further, explain how this person's private character and virtues are a fine model for public values.
>
> In week one, you selected a person that you admire, and you also provided some reasons for why you admired that person. You may retain the same person or, with further thought, select someone else. But the main task in this assignment is for you to explain why this person is worthy of admiration. You may do some research to find more specific biographical information and to choose meaningful examples of the person's actions and beliefs that show characteristics and values that you think noteworthy, even exemplary.
>
> In short, present for the reader a compelling argument with specific examples from the person's life. Also, explain why you admire these traits and actions. Bring in connections from your life, from contemporary issues, or anything that helps explain your thinking about the value of this person.

Draft due: TBA

Final version due: TBA

Length: 3–5 pages, double-spaced, 12-point font,

                                Times New Roman

Scene 2: WOI

In this capstone course a prompt is provided that asks students to do an evaluation that duplicates the one asked of the first-year students. Here, though, the students are required to cite specific texts, compare several figures, and to write a substantially longer paper. This course, under the general theme of "The Human Condition" focuses on the subject of citizens and their relationship to the State. A wide array of readings are examined, both Western and non-Western, from a range of disciplines—history, literature, philosophy, religion, and so on. Historical dynamics between citizens and the State where citizens confront moral dilemmas that complicate their relationship with state authority and imperatives are discussed. For these comparative reasons, the first-year students are directed to select public figures and to explain their public values—why they are model citizens—otherwise many will choose to write about their mother or father or friend. The prompt distributed to students about two weeks before the end of the term is as follows:

This course has been examining the relationship of an individual with the State. We have discussed the responsibilities that a citizen owes to the State and what the State "owes" citizens. We also have discussed factors that can complicate the citizen's relationship with the State—and the moral impera-

tives of these complications. In light of these discussions, what figure, current or historical, do you think most exemplifies those qualities that identify the good citizen? Or, what person, living or dead, do you most admire for their virtues and their activities that qualify him or her as a model citizen? You must connect your selection to issues that arise in at least three of our texts—and you should discuss the tensions and moral engagements that arise from their dilemmas, connecting them to your figure's public and/or historical role.

Use at least three of the following texts explicitly to help explain and illustrate your thinking: *Crito/Civil Disobedience, The Bible, Bhagavad-Gita, Eichmann in Jerusalem, Antigone, The Ox-bow Incident,* and *Bread and Wine*.

How has your understanding of the citizen-State relationship been affected by the readings and discussions? Explain your view of how a citizen should act toward the State in light of the readings you select.

Due: TBA

Length: 5 pages, double-spaced, 12-point font, Times New Roman

As can be seen, a good deal of effort was put into designing two writing scenarios that had strong similarities and allowed a reasonable basis for comparison when trying to assess improvement from the beginning to the end of the GEP. In many situations (sometimes on our own campus), the driving force becomes assessment, and what happens in the classroom is constrained to fit the needs of assessment. In my experience, this dynamic

results in a strong negative reaction from faculty. However, in the above example, assessment was always a secondary consideration. In this case, the emphasis was on developing meaningful learning experiences and carefully designed writing assignments that supported students in completing their final papers. This clear idea of what the final assessment entailed dictated what must happen in the classroom. Learning, though, is the priority and drives assessment. Ideally, the two should be so intertwined that one cannot be considered without the other. As the planning for assessment unfolds at CUHK, I recommend that special attention be paid to using assessments that have been fully integrated into the courses that comprise the GEP. The Foundation Course represents an excellent place to start.

This attempt in the arena of assessing writing in the GEP at UW-Whitewater is perhaps best characterized as one of "fits and starts," which culminated in securing the cooperation of one instructor who designed his 101 and WOI classes so that the curriculum supported the production of papers on the same topic in both classes. Specifically, each prompt produced papers that demonstrated student performance in three of the nine general education goals. Each prompt required the students to "think critically and analytically" and to "synthesize knowledge" (Goal 1) in presenting their arguments and explaining their choice of a model figure. Furthermore, their selection revealed the ability to make "sound ethical and value judgments based on [their] personal value system" (Goal 2). Finally, their written papers necessitated that they "communicate effectively in written . . . form" (Goal 3). These latest papers represented some improvement in both classes, but most notably in WOI.

To what, then, can this improvement be attributed?[23] Early on, efforts at assessment were made largely in response to external forces—namely, accrediting organizations, senior university administration, and others. These results were not widely embraced on campus until several years into the project, when there was more discussion about the state of student writing on campus and action was taken by some departments, most notably, history. The campus-wide initiatives described earlier were, at least in part, prompted by results from the writing assessment. Along the way, meetings to discuss the rubric with faculty teaching 101 and WOI raised awareness of what was being attempted and the care that was being taken to honestly assess student writing. For example, the rubric was revised several times based on feedback from the raters who were actually using it. And, at least in this one case, assessment was not an "add on" but an integral part of learning in the classroom. How do we know students have learned? It is that question that lies at the heart of what should be an ongoing effort to improve the learning experiences offered to students, and the best way to do that is to weave assessment into the fabric of the GEP.

At the classroom level, this same idea is obvious in the techniques offered by Angelo and Cross (1993). They are simply part of the curriculum and viable tools to help students learn. This kind of integration is a worthy goal for faculty and program leaders, although it is likely not to be attainable in the early stages of implementing an assessment plan. However, by degrees,

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23 Certainly a number of issues could be raised regarding the reasons for improvement from the standpoint of sound research design. However, it is important to remember that the primary goal is to generate data that will guide the efforts to improve a specific program, not produce results that are generalizable to other programs. The principles of sound research design should always be followed, so long as the integration of assessment and the curriculum is not compromised.

as my colleagues and I discovered, it can and should occur. In the early days of my involvement in assessment, I was preoccupied with imposing a framework on departments and programs that was grudgingly accepted. Energy was poured into writing outcomes, developing measures, gathering data, and using the data to close the feedback loop. Learning was rarely mentioned. As assessment procedures began to function across our campus (and I am sure at others), the disingenuous nature of the enterprise became apparent, and we were determined to work towards a different model—one in which the curriculum and assessment become seamless, complementing each other rather than being at odds.

Conclusion

I began with the goal of sharing some of my perspectives on three concepts: outcomes, learning, and assessment. As students proceed through a course of study (like a GEP), some learning likely occurs, even (especially?) if students spend every waking moment on the Internet. Assessment, though, has more to do with delineating specific outcomes of interest and determining the extent to which they are achieved. This is a reasonable expectation for a GEP where students are required to take certain courses, often in a predetermined sequence. If those who designed the curriculum feel strongly about what students are expected to learn, then they should not balk at assessment; either the designers know what they are doing or they do not. Assessment provides a mechanism to monitor and improve the impact of programs. Prior to embarking on any educational enterprise, it makes good sense to determine what students are expected to know and be able to do, how we intend to help

them accomplish our outcomes, and how we will know the extent to which outcomes have been achieved. These are reasonable expectations for faculty, and a responsibility that should be eagerly embraced.

After a career that has paralleled the rise (and continuing rise) of the assessment movement, my impression is that faculty do not often react in ways that demonstrate support for assessment—in fact, their response is often just the opposite. Some of this might be due to how assessment is presented to faculty; too often, it comes from the top down. Sometimes, their response might be seen as obstructionist behavior, but I would offer another perspective. In some of my work here at CUHK and elsewhere, I am convinced that at least some objections stem from the perception that assessment will somehow constrain the efforts of faculty. They feel that their aspirations for their students' learning are being limited and that the serendipitous gains of students will have no chance to emerge from the mire of what can be conveyed in an outcome. I believe that most faculty are expressing sincere reservations (and sometimes outright hostility).

What has made increasing sense to me is the need to design workshop materials that actually demonstrate how these ideas can work for faculty. Certainly, the administrators who mandate assessment are usually incapable of helping faculty make these connections and have often insulated themselves from what is happening in real classrooms. What I have tried to do is redirect faculty energy—away from their broader aspirations for their students and towards the measurable outcomes that form their foundation. When I hear faculty describe the relatively sophisticated kinds of thinking that they desire for their students, I see them embodied in the higher levels of the Bloom Taxonomy. Once outcomes are stated, the real challenge is designing

instructional activities and assessments that give students the opportunity to learn and to be held accountable for what they have learned Education is not about faculty but about students. Outcomes, learning, and assessment put students first.

Appendix I. Bloom's Taxonomy— A Learning Guide

1. **KNOWLEDGE (*recalls or recognizes specific information*)**

Who	Choose	Label	Name	Repeat
What	Define	List	Omit	Select
Why	Describe	Locate	Recall	
Where	How	Match	Record	
When	Identify	Memorize	Relate	

2. **COMPREHENSION (*translating, interpreting, and extrapolating*)**

Defend	Condense this paragraph.	Paraphrase
Demonstrate	Give an example of	Recognize
Describe	Is this the same as . . .?	Report
Discuss	State in one word.	Represent
Explain	State in your own words.	Restate
Express	What are they saying?	Review
Give examples	What does it mean?	Rewrite
Indicate	What exceptions are there?	Select
Infer	What part doesn't fit?	Show
Judge	What restrictions would you add?	Summarize

Locate	What seems likely?	Tell
Match	What seems to be?	Translate
Outline	Which is more probable?	
Explain what is happening.	Show in a graph or table.	
Explain what is meant.	Sing this song.	
Is it valid that . . .?	What does this represent?	
Read the graph or table.	What are facts? Opinions?	
Select the best definition.	Which statement supports the main idea?	

3. **APPLICATION (*situations that are new or novel to the student*)**

Apply	Identify the results of	Employ
Change	Judge the effects.	Illustrate
Compute	Predict what would happen if	Operate
Construct	Tell how, when, where, why.	Practice
Demonstrate	Tell what would happen.	Select
Discover	What would result?	Use
Dramatize		

Choose the best statements that apply.

Tell how much change there would be.

4. **ANALYSIS (*breaking down into parts*)**

Analyze	Determine the factors.	Examine
Break down	Make a distinction.	Identify
Categorize	State the point of view of	Outline
Classify	What are the assumptions?	Separate
Critique	What is fact? Opinion?	Solve

Diagnose	What is the function of . . .?	Test
Diagram	What is the premise?	
Differentiate	What is the theme?	
Distinguish	What motive is there?	

Implicit in the statement is the idea that . . . .

What literary form is used?

What are the least essential statements?

What persuasion technique is used?

What conclusions are valid?

What is the relationship between . . .?

What does the author believe?

What statement is relevant, extraneous to, related to, not applicable?

What ideas apply? Do not apply?

Which ideas justify the conclusion?

What are the inconsistencies? Fallacies?

What is the theme, main idea, subordinate idea?

5. **SYNTHESIS (*combine the elements or parts to form a new whole*)**

Arrange	Find an unusual way.	Design	Organize	Reorganize
Assemble	Formulate a theory.	Develop	Originate	Revise
Choose	How else would you . . .?	Devise	Plan	Tell
Combine	How would you test . . .?	Do	Predict	Visualize
Compose	Propose an alternative.	Generate	Prepare	
Construct	Solve the following:	Invent	Pretend	
Create	State a rule.	Make	Produce	
Dance	What would happen if . . .?	Make up	Reconstruct	

6.   **EVALUATION (*according to criteria and state why*)**

Appraise	Decide	Prioritize
Assess	Defend	Rank
Choose	Determine	Rate
Compare	Evaluate	Select
Criticize	Grade	Support
Critique	Judge	Value

Find the errors.

What fallacies, consistencies, inconsistencies appear?

Which is more important, moral, better, logical, valid, appropriate?

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