The Consequences of e-Learning[1]

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It is time for realism regarding the applications of information technology to education and training[2]. People learn; electrons do not. Accordingly, the dust will eventually settle from the flurry of activity related to "e-Learning," in all of its manifestations, and the foregone conclusion will stand out: learning is hard work. There is value in remembering this conclusion because in this Internet era, there is sometimes the impression gained that all the human effort involved in learning and in the achievement of excellence has been removed by information technology and knowledge management.

Since the inception of the world-wide web, nothing has changed about the ways that people learn (Bransford, Brown, and Rodney, 1999). In fact, there is nothing electronic about learning. Learning is a process that includes the actions of study and practice (Swezey and Llaneras, 1997), sometimes for years (Ericsson and Lehmann, 1996), and the assessment of effectiveness as a change in the learner (Skinner, 1953, 1954), a change that might be observed and documented by others or even by the learner as a self-evaluating authority. And one important advantage of a book as a repository of managed knowledge for learning is that it is easy to use (Brock, 1997). The impact of web-based instructional delivery and assessment of competence, however, will have a profound consequence on pedagogy, particularly as the art and science of teaching are tailored to the needs and status of the individual learner. The consequence will be a rational pedagogy that most of us only dreamed about as students ourselves. This is evidenced by the volume of emerging commentary that addresses the current and potential impact of the world-wide web and automated instructional delivery on education and training (Eamon, 1999; Hodgins, 2000; Krantz and Eagley, 1996; Lange, 1999; Tennyson, 1999). A common denominator within this stream of important and timely discussion is the attempt to cope with individual differences among learners and to overcome them.

Those of us who now write editorials for our colleagues to read and ponder were once students ourselves. We sat there in large classes. We listened to lectures that were sometimes inspiring, more often not. We took notes as the professor spoke, and we studied a textbook. We managed our learning under the strict temporal constraints of a course. We sometimes experienced "just-in-time" learning on the night before an examination. We recited on objective tests, usually, and these evaluations gave rise to grades, typically a distribution of letter grades that intended to show our intellectual competence in a subject matter relative to the competence displayed by our student colleagues. Indeed, the mission of the academy was to present information in a constant format and then to document individual differences in the use of that information. Even though many of us excelled academically under such circumstances, we all harbored a nagging suspicion that something was fundamentally flawed and unfair about the whole thing. That was the correct feeling to have.

All of us knew then that the impact of the instructional delivery media, typically lectures and books, and the assessment methods, typically objective tests, would differentially affect the members of a diverse group of students taking a particular course. All of us knew then that the students in a class were not equally advantaged in academic background, motivation, maturity, study skills, and available energy to undertake learning within a competitive academic context. There was a tacit failure by the academy to adopt course admission criteria and course exit standards of excellence that would address individual differences as a factor to be solved *by the academy*. Instructional delivery media, together with organizational constraints, failed to accommodate those differences and to overcome them. We now look with fascination at the applications of information technology in education and training, and some of us may wonder how our own careers, and those of our students, might have developed differently if we had used the world-wide web, simply because this technology has occasioned an enlightened and compassionate understanding of individual differences among learners.

It will no longer be business as usual within academe, and the transformation will produce a global, egalitarian, shared, and ultimately optimistic sociological context for education and training. The reason is that the conditions that promote efficient and effective learning will be made increasingly accessible to public scrutiny, debate, and evaluation. Students, as newly empowered consumers of education and training products and services, will not be complacent in the face of inferior alternatives, whether provided by public, private, or commercial sectors of society. The consumer of education and training products and services now has so many options available that a constructive competition among providers is responding to a consumer-generated evolution of intellectual products and services. This evolution favors a better match between the individual student and the process of learning. This evolution will occasion a reconsideration of the significance of traditional accreditation and credentialing au-

thority, and most importantly, the reconsideration will be driven by the student consumer, not by elitist organizations.

These developments have not escaped the attention of the professoriate (Eamon, 1999), especially as the time-honored recognition of general intellectual achievement and merit (*i.e.,* academic degrees) continues to lose force, and as the arbitrary, if not increasingly anachronistic, degree milestones continue to support the needs of the academic organization, not the student. But organizations, to include formal and accredited educational institutions, are being propelled to address the needs of the student in ways that have long been known to benefit the individual learner (Bloom, 1984). Where is it written that the pace of a life must be controlled by an academic institution? Where is it written that a course grade must be frozen in time forever? Where is it written that a student must be limited to only a single evaluation occasion, without the opportunity for additional learning to achieve an intellectual criterion of excellence? Where is it written that the scale of an intellectual unit must be a traditional semester-long course? A new unit of measure is required, an intellectual metric of learning that is quantifiable without regard to these customary constraints (Greer and McDonough, 1999). The evolution to a rational pedagogy is evidenced by relationships between commercial online-instruction enterprises and major academic institutions (e.g., UNext.com) in which the products are downscaled for effective information resource management on the Internet, rather than in the classroom. The reduction in the size of the units of mastery and the elimination of arbitrary timelines for completion are constructive developments in the effective management of individual differences among learners.[3]

The results of public dissemination and discussion of education and training strategies, via the world-wide web, will produce an informed learner who will shop, comparatively, for the optimal learning strategy to achieve a specific competency objective. Hardly a day goes by without reading the news of yet another Web-based learning opportunity with subject matter ranging from Java[4] to conflict analysis and management[5] . In many ways, e-Learning approaches are best suited to knowledge domains where the steps to mastery and the assessment of competence are precise and non-controversial. Mastering the arts of critical analysis, reflection, and synthesis, however, may sometimes require a mentor – a person – because the judgments involved may not always lend themselves to precise specification. Neglecting fundamental learning parameters in favor of a preoccupation with information technology and with making e-Learning systems more and more human-like could drive the "Turing test" to gratuitous philosophical discourse that will not advantage a learner's acquisition, retention, and use of knowledge. Finally, a rational pedagogy, in addition to fostering mastery of a particular knowledge domain, also teaches learning discipline to those students who lack it, and e-Learning and mentoring strategies may be separate or synergistic at different occasions in a lifelong process of intellectual development and contribution.

The diffusion of a rational pedagogy will require change management initiatives that will extend beyond the academic organizational level and even societal level. A rational pedagogy, recognized and practiced by the global community, will require enlightened thought on the sources and consequences of individual differences. And the traditional milestones and certificates of intellectual achievement and merit will fall away because they will no longer be useful.

A totally effective education and training environment, when applied to information technology instructional strategies that are enhanced by the world-wide web, will include factors that have long been identified as contributing to an optimal and multi-dimensional learning context – a personalized system of instruction (Keller, 1968). The ingredients of such a system have long been known to contribute to an optimal learning environment for the individual student (Ferster and Perrott, 1968). Today, these ingredients might include the following instructional tactics and resources, in combinations that depend on the knowledge domain and the objectives of learning: programmed instruction modules, web-based delivery and management of information, supervised laboratory exercises, interactions with peers and experts, mentoring, individual student research, traditional textbooks, industry certification training, lectures, and the library, to name just a few. The integration of e-Learning information technology into this framework, together with the evolution toward a rational pedagogy, bodes well for the universal acceptance of an enlightened perspective on the sources of individual differences and the availability of opportunities for all students, everywhere and at any age, to reach their potential throughout their life span. In a universally accepted rational pedagogy, evaluation outcomes will be entry points to progress for all, not end points for some. This is long overdue.

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Endnotes

[1] The writer appreciates the comments by Ashley G. Durham, Angela Kaan, and Roy Rada about the opinions expressed here, for which I assume sole responsibility.

[2] The debate regarding "education" and "training" occasions uproarious discussions within the professoriate. Somehow, teaching vocationally oriented skills within a university setting is perceived as less intellectually meritorious than teaching the arts of knowledge assimilation, reflection, and generation. In this e-Learning era, however, many students seek the former, and all students need the latter. The question is this: who has the wisdom to dictate the balance and the timing of the two? Perhaps that is best left to the consumer. But both objectives should be honored, and many academic organizations, to include research universities, are taking steps to ensure quality in both areas of intellectual development. At UMBC, for example, an industry certification center (http://continuinged.umbc.edu/IT/) provides authoritative instruction in many areas of information technology that prepares the student to pass industry certification examinations. In both undergraduate and graduate degree programs, moreover, a student who successfully passes an industry certification examination may receive limited academic credit when a non-credit "value-added" academic course accompanies the former. Since the industry certification courses are taught by technical experts, this approach relieves the research professoriate from the impossible task of maintaining both research productivity and technical competence in information technology sufficient to offer authoritative and effective instruction in the latter. This is very good news, indeed, for the research professoriate. At UMBC, Professor Kip Canfield (canfield@umbc.edu) has provided the initiative for the development of these important interrelationships between scholarship and skill.

[3] An example of a competency-based degree program offered by an academic institution is evidenced by UMBC's "flexible masters" degree program in Information Systems that will be available online in 2001. Under the directorship of Professor Roy Rada (rada@umbc.edu), this e-Learning program will provide the student with access to modularized units of knowledge in a progressive fashion where demonstrated competence is required across successive knowledge modules. The student may complete successive modules in a self-paced progression of study to the terminal degree objective, and competency evaluations may be repeated until they are passed at a standardized criterion of achievement. This approach is "flexible" because it adjusts to the needs and status of the individual student, while maintaining academic rigor, and it is an exemplar of a rational pedagogy.

[4] http://www.jobsuniversity.com/

[5] http://modules.royalroads.ca/