

# It's Not About Time:

## A Fresh Approach to Educational Equivalency

By Ryan Watkins and Charles Schlosser

In the past 50 years there has been a surge of educational technologies, from systematic instructional design to VCR recorders to computer-based and Internet-based instruction. This transformation of the tools available to educators has transformed education into a system that can be agile and flexible; no longer imprisoned by the confines of the classroom. However, it is both ironic and unfortunate that the standard measure of the equivalency of academic courses (and degree programs), an innovation of the early 20th century and best suited for educational institutions of that era, remains as the primary standard for judging educational equivalency.

Seat time in the classroom, as expressed in Carnegie Units, is a widely accepted and convenient standard, but offers little utility for today's institutions of higher education. Technology, especially in the field of distance education, has made it so that time is no longer an essential criteria in determining the equivalency of academic courses or degrees. Regrettably however, many proposed other alternative models of equivalency merely build complex relationships between new delivery systems and the conventional standard (e.g., two hours of interactive chat equals one hour in the classroom), thereby continuing to strengthen the misperception that time-in-the-classroom or time-on-the-Internet is the goal of instruction (Watkins and Schlosser, 2000a).

Capabilities-Based Educational Equivalency (CBEE) Units offer a

fresh approach an alternative for institutions that wish to be responsive to the changing characteristics of higher education (see Watkins and Schlosser, 2000a, 2000b, 2002). While permitting time (and location) to be different across courses and degrees, this fresh approach to equivalency facilitates the comparison of student accomplishments and competence. By

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holding student capabilities relatively constant, the CBEE Units approach focuses the determination of equivalency on capabilities-based objectives (see Gagne, 1991, 1977) rather than time in the classroom. This article briefly traces the origin of the Carnegie Unit and its application, describes a proposed alternative, and illustrates its use within a graduate program of a dual-mode university (i.e., a distance education and conventional classroom institution).

### EDUCATIONAL EQUIVALENCY AND ACCREDITATION

So what is the Carnegie Unit and how did we end up with it? Oddly enough, while defining what constitutes a college in 1909, the board of the Carnegie

Foundation for the Advancement of Teaching established a standardized measure of academic equivalency: a standard of 750 minutes with a qualified instructor equaled one academic credit hour, or Carnegie Unit. The Carnegie Unit has since become the standard of academic accreditation and equivalency (Johnsen and Taylor, 1995). Since then the primary goal of accreditation has been the evaluation of "quality" in academic programs and institutions. Lezberg (1998) has noted however that "The accrediting bodies do not prescribe any particular method for ensuring the integrity of the academic work" (p. 31). Thus, time in the classroom remains the principal factor in conventional educational equivalency, while learner achievement is left to vary or is assumed to be equal.

The development and integration of technology in education has however reduced the applicability in higher education. Decreasing use of the conventional lecture in higher education, along with the growth in the number of non-traditional students, educational best-practices within many institutions have shifted away from a dependence on the traditional classroom. Today, at many colleges and universities, professors and students are less likely to spend 150 in the classroom during each of fifteen weeks that comprise a semester than they are to supplement their classroom time with online discussion groups, Internet chats with the instructor, and/or a variety of technology-driven instructional tactics. Therefore, the question of educational equivalence has become of increasing

Table 1. Human Capabilities and the Proposed CBEE Units (based on Watkins and Schlosser, 2000a, 2000b, 2002)

Human Capabilities (Gagné, 1977)	Objective Verb (Gagné, 1977)	CBEE Units Per Mastered Competency
Intellectual skills:		
Discrimination	Discriminates	1 unit
Concrete concept	Identifies	2 units
Defined concept	Classifies	3 units
Rule	Demonstrates	4 units
Problem solving	Generates	5 units
Cognitive Strategy	Originates	6 units
Information	States	1 unit
Motor Skill	Executes	4 units
Attitude	Chooses	4 units

concern as students and faculty compare conventional and non-conventional instruction (see Simonson, 2000).

As Pfnister (1991) noted, Perhaps we are entering a time when new paradigms of the teaching/learning process need to be developed. Or perhaps technology is forcing on us a new paradigm, whether we are consciously aware or not (p. 39).

By continuing to apply criteria rooted in “seat-based hours” to measure the equivalency of educational courses and degrees, the field of education has, to a large degree, moved to valuing the size, style, color, speed, and “high-tech” appeal of delivery, while failing to fully examine the value added by its content. Should a common “unit of exchange” for educational equivalency be classroom time, time on task, objectives offered, or learning? We suggest that the primary factor of equivalency should focus on the attained and demonstrated capabilities of the learner.

Many accrediting associations have also recognized this shift and demonstrated their commitment to achievement-focused education by maintaining “outcomes-driven” or “Competency-based” criteria for assessment and evaluation (see The Commission on Colleges, Southeastern Association of Colleges and Schools, 1997, 2000). As an example, in 2000 the Inter-Re-

gional Accrediting Committee (IRAC) announced that Western Governors University, the first competency-based university without Carnegie Unit-based credit hours, received “Candidate for Accreditation” status (Western Governors University, 2000). In 2003 it is anticipated that Western Governors University will become the competency-based university to receive full accreditation. Based on these trends, we suggest that in the near future the accreditation of college courses and degrees will likely require demonstration that learning results (and objectives) are appropriate to the rigor and extensiveness of the credit hours awarded by the institution (Watkins and Schlosser, 2002). This transformation in the fundamental way we of thinking about educational equivalency will however in the short-term challenge many of the accreditation and administrative functions of educational institutions, though offering increasing benefits to institutions, faculty members, and students alike in the long-term.

### A FRESH APPROACH

As an alternative to the complex relationships for aligning technology-mediated instruction to that of the traditional classroom the CBEE Units ap-

proach is a viable alternative to the Carnegie Unit for institutions. Since it is not time-dependent but rather is responsive to emerging technologies, supportive of systematic instructional design, and focused on the achievement of learners (Watkins and Schlosser, 2000a) the CBEE Units approach can provide the flexibility required for today’s educational institutions to transform in parallel with the advancements being made in instructional practice (i.e., less emphasis on time-in-seats and more emphasis on student learning).

The CBEE Units approach, by using capabilities-based objectives (Gagne, 1991, 1977), suggests a standardized formula for relating instructional objectives with academic credit (rather than the traditional relationship of time and credit). By assigning a unit value to the demonstration of human capabilities specified in Gagne’s (1977) taxonomy (or an alternative taxonomy of educational objectives), the equivalency model differentiates instructional objectives in relation to academic credit hours. The proposed relationships of CBEE Units with both Gagne’s (1977) and Bloom’s (1956) taxonomies is illustrated in Tables 1 and 2.

A proposed standard of CBEE Units per academic credit hour as a determination of educational equivalency can be based on the attained knowledge and skills of learners (as specified by the instructional objectives of courses and degrees) rather than time in the classroom. By relating the number and scope of objec-

Table 2. Bloom’s Taxonomy of Educational Objectives and the Proposed CBEE Units

Educational Objectives (Bloom, 1956)	CBEE Units Per Mastered Competency
Knowledge	1 unit
Comprehension	2 units
Application	3 units
Analysis	4 units
Synthesis	5 units
Evaluation	6 units

tives to the credit hour value of a course (e.g., 30 CBEE Units per academic credit hour), instructors are supplied with an approximate benchmark when determining the scope and sequence of a course, regardless of the instructional delivery system chosen (i.e., in the classroom or online).

The required number of attained capabilities per credit hour may differ among academic disciplines, though we propose that within an academic discipline a standard ratio should be set for equivalency. For example, in initial application the 30 CBEE Units per credit hour ratio appears to be appropriate for many graduate level courses in education (see Watkins and Schlosser, 2002). As with the number of CBEE Units assigned to the hierarchy of capabilities-based objectives, the number of CBEE Units required for one academic credit is a topic of continuing research.

The CBEE Units approach does not propose to standardize objectives (or curriculum) across academic programs and institutions, and is not the intention of the proposed approach to define for educators the content of their courses; rather to provide a standardized measure of educational equivalency that is not time-based (Watkins and Schlosser, 2000a, 2000b). Without defining the content or evaluating the quality of content, institutions and accreditation bodies can use this non-time-based approach as a basic framework for determining the equivalency of academic courses and degrees, based on student achievement rather than time-in-seats.

### **APPLICATION OF THE CBEE UNITS APPROACH**

As an alternative to conventional classroom based graduate degree programs, the faculty of the Instructional Technology and Distance Education (ITDE) graduate programs at Nova Southeastern University have been interested in the application of the CBEE Units approach (Watkins and

Schlosser, 2002). The ITDE program offers graduate degrees (Masters and Ed.D.) focused on the applications of technology and distance education and like many graduate program faculty they are sometimes frustrated when determining the appropriate quantity and type of content of distance-delivered courses that would be judged (and accredited) as equivalent to those offered in the conventional classroom.

Though equivalency can be thought of as equal experience that should mirror the content of a classroom course, it is more practical and pragmatic that equivalency should be based on approximate equivalency of knowledge and skills demonstrated by "successful" learners. The CBEE Units approach has been a useful tool, as it provides an approximate benchmark for the scope of a one-, three-, or even five credit hour course. By making quantitative approximations (i.e., CBEE Units) for the qualitative description of what learners will achieve (i.e., objectives) this fresh approach to educational equivalency offers educators an approximate standard for how many instructional objectives should be attained in a course that is worth a given number of academic credit hours (Watkins and Schlosser, 2000b).

Applying the CBEE Units approach to an actual course within the ITDE program provides a sample application of CBEE Units along with instructional resources and possible assessments as illustrated in Table 3. Since the objectives and supporting instructional planning materials were created with the CBEE Units framework in mind, the course designers developed and assessed objectives to adhere to Gagne's taxonomy using appropriate action verbs. Just as easily Bloom's (1956) or other taxonomies could be agreed upon and used within the CBEE Units approach depending

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on the desires of the faculty. Colleagues, who teach both the course used in the sample application as well as similar courses at other universities, reviewed the course objectives; each agreeing that the scope of the objectives was appropriate for the corresponding academic credits.

### **CONTINUING RESEARCH**

Even after the initial application of the CBEE Units approach many areas for continuing research remain for the application to CBEE Units to be considered for broad application at colleges and universities. The CBEE Units model, as presented in the sample application, employs Gagne's taxonomy of objectives. It does so because of its familiarity to and wide application by instructional designers. However, alternative taxonomies of educational objectives should be considered and compared. Alternative taxonomies, such as Bloom's (1956), Forshay's (1958), or Krathwohl, Bloom and Masia's (1964) may also be correlated with related CBEE Units. Research in the area would be useful to illustrate the flexibility of the CBEE approach for application a broad range of educational settings where instructors may choose an objectives format and taxonomy with which they feel most comfortable.

Capabilities-based objectives are currently assigned CBEE Unit values in single-digit increments; for in-

Table 3: Sample Application of CBEE Units (based on Watkins and Schlosser, 2002)

**Sample Application of CBEE Units for a Graduate Course in Education**

Course Objectives: Given appropriate resources, learners will be able to...	Type of Objective	CBEE Unit Value	Instructional Resources	Possible Assessments of Performance
Originate a valid and useful personal educational philosophy based on two or more theories of learning.	Cognitive strategy	6	<ul style="list-style-type: none"> <li>• Required texts</li> <li>• Online readings</li> <li>• E-mail</li> <li>• Asynchronous chat</li> <li>• Audiobridge</li> </ul>	<ul style="list-style-type: none"> <li>• Assignment 3</li> <li>• Class presentation</li> </ul>
Accurately discriminate between the characteristics of an epistemology (realism, pragmatism, etc.) and a theory of learning (behaviorism, situated cognition, etc.).	Discrimination	1	<ul style="list-style-type: none"> <li>• Required texts</li> <li>• Online readings</li> <li>• E-mail</li> <li>• Asynchronous chat</li> <li>• Audiobridge</li> </ul>	<ul style="list-style-type: none"> <li>• Assignment 1</li> <li>• Online discussion</li> <li>• In-class performance</li> </ul>
Accurately define the components of a system.	Concrete concept	2	<ul style="list-style-type: none"> <li>• Face-to-face instruction</li> <li>• Required texts</li> <li>• Online readings</li> <li>• Video conference</li> </ul>	<ul style="list-style-type: none"> <li>• Assignment 2</li> <li>• Online discussion</li> <li>• In-class performance</li> </ul>
Accurately generate descriptions of instructional strategies (including organizational, delivery, and management strategy characteristics) for each of six theories of learning.	Problem solving		<ul style="list-style-type: none"> <li>• Face-to-face instruction</li> <li>• Required texts</li> <li>• Online readings</li> <li>• Video conference</li> </ul>	<ul style="list-style-type: none"> <li>• Online discussion</li> <li>• In class performance</li> </ul>
Originate a valid and useful educational activity for each of six theories of learning.	Cognitive strategy	6	<ul style="list-style-type: none"> <li>• Face-to-face instruction</li> <li>• Required texts</li> <li>• Online readings</li> <li>• Video conference</li> </ul>	<ul style="list-style-type: none"> <li>• Online discussion</li> <li>• In-class performance</li> <li>• Assignment 3</li> <li>• Class presentation</li> </ul>
Accurately generate an appropriate metaphor or analogy for each of six theories of learning.	Problem solving		<ul style="list-style-type: none"> <li>• Face-to-face instruction</li> <li>• Required texts</li> <li>• Online readings</li> <li>• Video conference</li> </ul>	<ul style="list-style-type: none"> <li>• Online discussion</li> <li>• In-class performance</li> </ul>

stance, a rule-focused objective has a value of four units and problem-solving focused objective has a value of five units (Watkins and Schlosser, 2002). Although Gagne's taxonomy does not impose that objectives be

considered in a pecking order, a hierarchy is implied and value weightings were based on this implied hierarchy rather than outside research for the initial applications of the CBEE approach. In practice, this weighting

has seemed about right, and feedback from peers has been supportive of these values. However, no research has been conducted to determine the appropriate relative weighting of objectives.

Related issues such as the ratio of

academic credits to capabilities-based objectives and the utility of these ratios across academic disciplines must also be researched. The goal of this article is however limited to providing a basis for continuing research and professional dialogue in the area of educational equivalency and alternatives to the Carnegie Unit.

## SUMMARY

The increasing use of technology in higher education is challenging educational institutions to examine alternatives to time-based models for educational equivalency. Confirming the relationship of educational equivalency across courses, certificates, and degrees is becoming a mounting challenge for educators and administrators at public and private institutions alike. Though the Carnegie Unit has provided higher education with a convenient standard of equivalency for nearly a century, its utility for today's colleges and universities is diminishing.

Though numerous research questions remain to be investigated, through initial application the CBEE Units approach to educational equivalency offers a numerous benefits (Watkins and Schlosser, 2002), including:

1. A common measure of educational equivalence across departments, colleges, and universities. This is especially valuable when evaluating transfer credit.
2. Elimination of the need for complex formulas that relate inappropriate variables, such as time.
3. A better way for students, parents, employers to judge courses, including the skills, capabilities, and knowledge students will gain from a course.
4. Reinforcement of appropriate course design principles, through its requirement of careful development of objectives.
5. A reduction in redundancy within and between courses-another benefit of the careful development of objectives.

For instructors and educational in-

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stitutions looking to ensure the approximate equivalency of conventional and non-conventional courses and degrees (or accrediting agencies evaluating the practice of distance education programs and universities) the CBEE Units approach offers a viable alternative. The continuing development of the CBEE Units approach will require additional dialogue and research from a host of educational intuitions (traditional and non-traditional) as well as accrediting association, but it may provide educational institutions with a starting place for meeting the requirements of an inevitably competitive future (Watkins and Schlosser, 2000b).

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