QUANTIFYING ONLINE LEARNING CONTACT HOURS

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Technological and pedagogical advances in distance education have accentuated the necessity for higher education to keep pace regarding institutional infrastructures. Each infrastructure—driven by a common mission to provide quality learning—interprets quality according to standards established by various governmental and accrediting entities. Staying ahead of the technological and pedagogical changes have been challenging for many public higher education institutions, which are continuing to struggle with online course design and delivery modes (Suttle, 2010). Online universities, however, have aggressively and strategically responded to technological and pedagogical shifts across institutional, departmental, program, and course levels according to their institutional mission, vision, and core values. The American Public University System (APUS), a leader in postsecondary online learning, continues to align these foundational components through systematic program and course assessment. Demonstrating commitment to quality, APUS leaders developed the APUS Online Contact Hours Calculator to assist faculty and program directors with the assessment of total course contact hours. Core learning management system tools used to complete in-class and homework projects were apportioned time requirements toward contact hour calculations, thus streamlining the course review process, adhering to governmental and accreditation standards, and ensuring the overall quality and rigor of each online course.

Keywords: online learning, contact hour calculation, online universities, model, assessment of learning, accreditation

INTRODUCTION

Online learning's popular phrase "anytime, anywhere" could easily be the catch-phrase of the 21st century. As the number of online learners continues to increase (Allen & Seaman, 2010), the demand for quality "anytime, anywhere" learning has been of great importance to higher education institutions nationwide. Further, the Learning Management System (LMS) has been "the primary vehicle for delivering courses and where related scholarly communities have emerged over the last 15 years" (Ice & Burgess, 2012, p. 447); therefore, pedagogy and institutional policy has been developed against common tools and components of the LMS (i.e., discussion board, chat, resources, learning activities). Despite the prevalence of LMS-use in higher education as a platform to deliver online learning, those serving on institutional strategic planning committees would be well-informed to develop policies and guidelines which accommodate technological and pedagogical advances, especially as online learning platforms continue to develop and evolve with additional innovative components to assess student learning.

Conversely, the development and implementation of institutional policy has been sluggish regarding these technological and pedagogical shifts. Even more troubling is that for those institutions that are transforming their policies and guidelines, many are developing them against face-to-face standards of practice. With regard to curriculum, instruction, and assessment, distance education experts vehemently argue that comparing face-to-face learning to distance learning is analogous to comparing apples to oranges, and institutions should therefore resist the urge to draft policy around this notion (Freeman, 2010; Suttle, 2010).

Institutional Background

Originally founded in 1991 as American Military University (AMU), APUS's main focus was to meet the educational needs of military personnel. Twenty-one years later, APUS has strategically positioned itself as a leader in quality distance education—serving the academic needs of all student populations and continuing to be the largest provider of higher education to the armed forces.

Through its member universities, American Military University and American Public University, APUS provides relevant and affordable distance learning to more than 100,000 working adults worldwide. More than 100 degree and certificate programs are offered in disciplines such as education, technology, business administration, liberal arts, national security, military studies, intelligence, homeland security, and criminal justice.

Institutional Mission, Vision, and Core Values

An institutional mission condenses and conveys its overall purpose and responsibility to its clientele. The mission of APUS is "to provide quality higher education with emphasis on educating the nation's military and public service communities by offering respected, relevant, accessible and affordable, student-focused online programs, which prepare them for service and leadership in a diverse, global society" (APUS website, 2011). This mission serves as the foundation for all present and future institutional decision-making.

The APUS vision focuses on providing superior and relevant distance learning programs to its learners. Specifically, APUS strives to (a) create interactive, effective learning environments for all constituents; (b) serve its constituents' diverse personal and professional development needs; and (c) expand access to affordable programs to underserved learners (APUS website, 2011).

Toward realizing its mission, APUS has further developed a set of shared principles and core values that include (a) learning; (b) quality; (c) integrity; (d) diversity; (e) freedom of inquiry and expression; (f) accountability; (g) access to underserved; (h) adaptive and responsive; (i) innovation; and (j) collaboration. Together, these principles and values ultimately prepare students for service and leadership in a diverse, global society (APUS website, 2011). The mission, vision, and core values are the essence of an institution and, as such, should inform all activities within the university. One branch of the higher educational institution, in particular, is receiving critical attention: technology and pedagogy.

Out with the Old, In with the New

Although there are many aspects to consider regarding the varied trajectories that technological and pedagogical change could take, the U.S. Department of Education's adoption of new regulations regarding an institution's eligibility to award academic credit put an end to ambiguity and lack of clarity regarding programmatic integrity. Specifically, the regulations set forth are two-fold: 1) a federal definition of the credit hour applicable to eligible institutions and 2) requirements for accrediting agencies, as a condition of their recognition, to review the institution's policies and procedures for determining credit hours and the application of those policies and procedures in practice, using the federal definition.

Therefore, in response to these regulations, the authors wish to focus specifically on the number of hours a student is involved in course learning that is reasonable and that further complies with contact hour requirements. This initiative stemmed from a comprehensive, institution-wide course review process aimed toward systematically identifying the strengths and areas for enhancement or improvement for each course offered at this institution. While conducting the course reviews, the authors further identified the need for a contact hour calculator that considers (and is adaptive to) various online learning components and platforms. As a result, a model was developed to ensure adherence to the contact hour regulations and to ensure course quality and rigor.

REVIEW OF THE LITERATURE

Unfortunately, the literature is sparse regarding the emerging topic of contact hours in online learning courses. This paucity of knowledge was determined following an exhaustive literature search using the following databases: (a) Academic Search Complete; (b) EBSCOhost; (c) EBSCO eBook Collection; (d) ERIC; (e) IEEE Computer Society Digital

Library; (f) Dissertations and Theses; (g) Wilson OmniFile; and one search engine, Google Scholar. Various combinations of keywords and phrases synonymous with the overarching topic were entered into all of the databases and the search engine. These keywords and phrases included *contact hours, seat time, academic credit hour, conver(ting, sion), model, framework, institutional assess(ing, ment), institutional policy, institutional infrastructure, calculate(ing, ion), learning management systems, distance education, distance learning, online learning,* and *online courses*. Of the 30 resulting resources, only 17 resources were determined to have a high level of rigor and relevance for inclusion.

Institutional Strategic Planning

In their 2011 report on distance online education, *Going the Distance: Online Education in the United States*, Allen and Seaman administered a survey to over 2,500 colleges and universities to gather information on the nature and extent of online education in the United States. One particular intent was to discover if online learning is part of each institution's long-term strategic plan. The survey elicited the following results: (a) 65% stated that online learning was a critical part of their long-term strategy; (b) for-profit institutions comprised 69% of institutions who agreed that online learning is critical; (c) for-profit institutions are the most likely to have included online learning in their strategic plan.

Interestingly, although the results of the survey indicated an increase in the number of students taking at least one online course in 2010 (over one-half million), Figure 1 illustrates results from years 2006, 2007, 2009, 2010, and 2011, revealing that a significant gap exists between CEOs who recognized that online programs are strategically important in their campus strategic plan (two-thirds of respondents) and CEOs who actually included online programs in their campus strategic plan (less than one-half of respondents).

Figure 1. Recognition of Strategic Importance of Online Programs

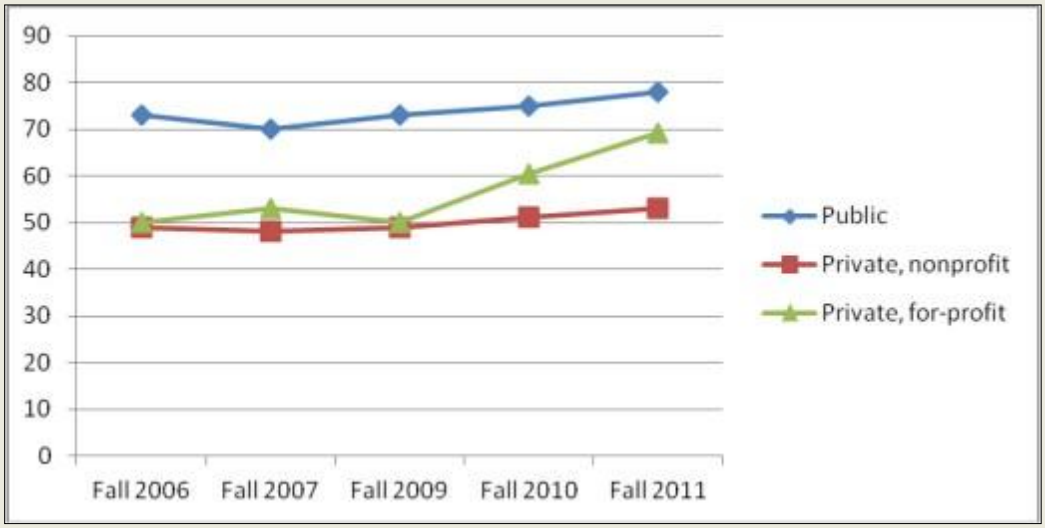

Figure 1. Online Education is Critical to the Long-Term Strategy of My Institution by Institutional Control – Fall 2006, 2007, 2009, 2010, and 2011

These perceptions are critical for understanding the overall institutional infrastructure and the specific factors that contribute to these perceptions, factors which, according to McFarlane (2011), involve cost, image, quality, and value which ultimately inform institutional regulations and pedagogies. Figure 2 displays an adaptation to McFarlane's original diagram on the perception gap between virtual and brick-and-mortar schools.

Figure 2. Gap between Virtual and Brick-and-Mortar Schools

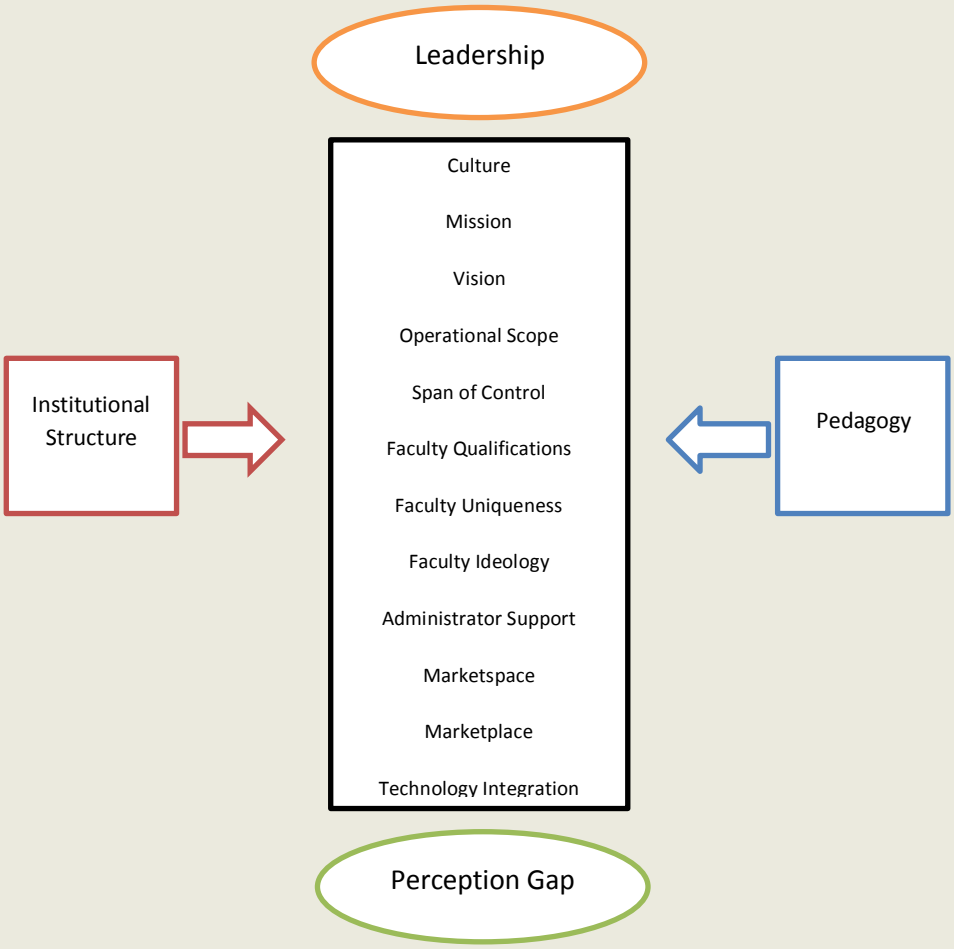

Figure 2. Perception Gap in Institutional Infrastructure and Pedagogy (adapted from McFarlane, 2011)

The bottom-line: overall success and competitiveness will be greatly determined by institutional leadership and how leadership views and responds to transformational change (Jones & George, 2009).

Institutional Infrastructure

The organizational or institutional structure, as framed by institutional leaders, is meant to serve as a guide for making decisions affecting pedagogy (McKenzie, 2003; Suttle, 2010). The framework from which institutional infrastructure is developed must reflect the mission, vision, and core values of the institution as a collective body. If it does not frame these foundational concepts, it is likely the infrastructure will result in a lack of motivation, quality, coordination, efficiency, and responsiveness to societal changes (Walonick, 2010). Ultimately, the deterioration of infrastructure will have negative effects on the quality of the product (Wheelen & Hunger, 2008), thus negatively impacting strategic planning and implementation (Olson, Slater, & Hult, 2004).

Changes in Tools? Pedagogy? Or Both?

Luckily, there are a number of institutional, pedagogical, and technological frameworks from which to fashion institutional infrastructure (Compton, Davis, & Correta, 2010). Drawing from pedagogical frameworks specifically aimed to support online learning, one of the most favored is the Community of Inquiry (CoI) Framework (Garrison, Anderson, & Archer, 2000). Comprising this framework are three constructs that are crucial to the overall online learning experience. These components include (1) Social Presence; (b) Cognitive Presence; and (c) Teaching Presence. Underlying each of these constructs are indicators or sub-categories that specifically define or describe which actions contribute to each construct. Figure 3 illustrates the underlying dynamics and interactions among all three presences.

Figure 3. Constructs Crucial to Online Learning Experience

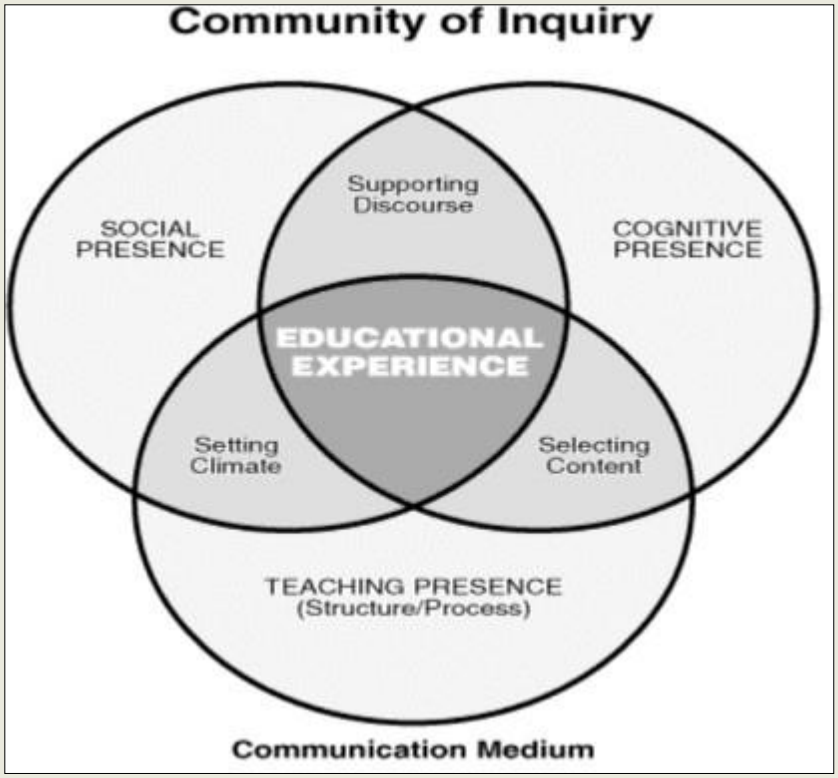

Figure 3. The Community of Inquiry Model (Garrison, Anderson & Archer, 2000)

The adaptability of the CoI Framework compared to various other learning architectures (Ice & Burgess, 2012) allows for transformative pedagogy—which is especially important as institutions begin to experiment and/or implement other learning platforms. When comparing online learning environments to brick and mortar institutions, it is clearly the technologies, or tools, that differ more than the pedagogical approaches. Despite the platform used for online learning, pedagogy will remain constant with regard to "mastery of content and curriculum, an appreciation of the various forms of standards, an awareness of assessment, and the ability to organize lessons that engage students in learning and knowing students well enough to make appropriate instructional decisions" (McFarlane, 2011, p. 33).

Contact Hour Calculations: Existing Models

Following the literature search, only one model has emerged to date that is specifically aimed toward supporting the Program Integrity regulations set forth by the U.S. Department of Education. The Implementation Model for the 2011 U.S. Department of Education Program Integrity Regulations (Simpson, 2011) serves as a guide for colleges that are preparing to implement the regulations and is based upon strategic planning at a Florida institution. The model outlines credit hour definition by (1) establishing procedures for monitoring regional accreditors' policies and procedures and reporting to appropriate departments any changes in the accreditors' policies; (2) developing policies and procedures to annually assess existing programs for compliance and communicate recommendations for curriculum modifications as warranted to the appropriate administrators; (3) establishing an evaluation policy and procedure; (4) establishing a communication protocol for alerting programs in need of modifications; and (5) establishing a tracking system to ensure that program modifications are implemented. Although helpful in terms of direction, this model lacks specificity and relevance to online learning as it currently operates in many institutions.

THE APUS ONLINE LEARNING CONTACT HOUR CALCULATOR: A NEW MODEL

The Purpose and Process

As previously mentioned, the development of the APUS Online Learning Contact Hour Calculator stemmed from an evaluation of all university courses for the purpose of ascertaining structural issues, compliance with university guidelines, level of rigor, instructor interaction, and other course issues. As such, the calculator was designed to benefit faculty and program directors in effectively and systematically assessing total course contact hours. As part of the review, APUS leaders began to investigate contact hours as part of the course evaluation plan. This investigation led to the refinement of APUS standards for contact which could be seen as equal to those established and espoused by other universities—whether online or on-ground.

This model includes many factors related to in-class and homework projects, as well as course reading requirements, toward attaining contact hour totals. As part of the APUS mission, the model will be revised and updated as more research in contact hour equivalents is conducted and specific course requirements are added.

The process for completing the course review requires the faculty member to

- complete an evaluation of each course in every program using academic guidelines and templates provided;
- provide a report and action plan for remediation and development of weak program courses;
- remediate all core and required classes coded as yellow and as many red classes as possible; and
- provide detailed plans for remediation and development of remaining classes by October 1, 2011. (APUS 2011)

A template was developed for evaluating adherence to best practices and has the essential components of a quality online course. The main components reviewed in this assessment included (a) syllabus; (b) course objectives and course materials; (c) interactivity; (d) technology; (e) assignments; (f) contact hours and student time; and (g) follow-up and next steps.

Defining Contact Hours/Homework Hours

APUS utilizes a variation on the traditional "Carnegie Unit" for measuring the amount of time our online students are engaged in learning. This can be expressed as an in-class function or a homework function. As is usual in Carnegie calculations of contact hours, one clock hour is equivalent to 50 minutes Carnegie contact units. In traditional "brick and mortar" higher education, contact hours can be viewed as the time that a student spends physically in the classroom, listening to a lecture, participating in discussion, taking an exam, or whatever is required for time in class. As an extension of this, students are advised they are to spend two to three hours studying per week for each hour spent in the classroom; this provides a basis for discussion on homework hours. Both in-class and homework time contribute

to the total number of contact hours for each course.

Contact/Homework Guidelines

APUS defines one unit of class credit as consisting of three hours of instructive learning per week for a 16-week class or six hours of instructive learning per week for an 8-week class. For the typical three credit class, it is expected that a student will be engaged in classroom learning experiences of 150 minutes x 16 weeks = 2400 minutes or the equivalent of 45 contact hours using the Carnegie unit of measurement. This means the student should spend these hours within their classroom participating in discussion boards, taking examinations, looking at PowerPoint slides, reading information from linked web sites, reviewing instructor lectures or any other items that engage the student *within* the APUS classroom.

Homework hours at APUS should equate to approximately two hours per every singular in-class contact hour for any given course. Items that fulfill the homework hours at APUS are reading the course text, completing formal writing/research assignments, answering questions on text readings, conducting research, studying for examinations, and other out-of-classroom course requirements.

As indicated in Table 1, APUS also further established reading expectations for each academic classification level of study. These expectations are included in the contact hour calculation spreadsheet.

Table 1
APUS Reading Expectations by Academic Classification

Classification Level	Reading Expectation Equivalents
Lower Level Undergraduate	400-600 pages or equivalent in online pages
Upper Level Undergraduate	600-800 pages or equivalent in online pages
Graduate	800-1000 pages or equivalent in online pages

Other factors included in the spreadsheet include number of discussion boards and requirements for posting; number of tests, including midterms and finals; other research and written papers; projects; level of class; study time for tests and exams; research time for projects; and other items typically found in our classes. Quantitative measurements of time were apportioned to each factor based upon pre-determined assumptions. These assumptions and measurements are outlined in Table 2.

At both the undergraduate and graduate levels of study, there are minimum requirements and basic expectations at APUS regarding contact hours. The three different levels of study, based on course number, are outlined in Table 3 with their suggested minimum total contact hours.

Using the APUS Online Contact Hours Calculator: A Sample Review

Meeting and exceeding minimal contact hour standards set forth by the Carnegie Foundation is one means to demonstrate a commitment toward meeting established standards for student contact and student learning.

From an initial pilot study using the APUS Online Contact Hour Calculator, the authors of the current study concluded that seven weeks of discussion boards with a final examination and formal research paper submission will typically cover the minimum in-class contact hours. However, if a discussion board seems more like an assignment than an engaging activity, the student may not be suitably engaged in the course. Additionally, the amount of time it takes to prepare for an exam, a discussion board posting, or to research a paper should bring a course within the expected range for total contact hours. Table 4 shows the course information requirements common to all contact hour course calculations.

Table 2
Homework Time Factors and Associated Time Measurements

Homework Time Factors	Quantitative Measurement
Composition speed for discussion board postings	25 words written per minute
Time provided for composing discussion board posting	20 minutes allotted per discussion board
Reading peers' discussion board postings	180 words per minute (the assumption is made that students read all of their peers' postings for the duration of the course)
Reading instructor's feedback	10 minutes allotted per graded assignment for the student to review instructor feedback
Quizzes	60 minutes allotted for taking a quiz, and 60 minutes of preparation time
Weekly lecture notes:	50 minutes allotted per issuance of weekly lecture notes (ex. eight week course = eight weekly lecture notes; sixteen week = sixteen weekly lecture notes)
Links to external websites	20 minutes per external URL
Midterm examination	10 hours are allotted for taking the examination 10 hours for studying/preparation
Final examination	3 hours are allotted for taking the examination 10 hours for studying/preparation or (20 hours for studying/preparation when a midterm exam is not administered)
General reading assumption	250 words per double-spaced, typed page
Reading course materials	200 words read per minute or 180 words read per minute for electronic materials
Upper level undergraduate courses:	8 hours granted to students taking this level of study
Miscellaneous assignments	120 minutes granted per miscellaneous assignment
Composing a formal writing assignment	120 minutes granted for preparation time 20 words written per minute 30 minutes granted for each page of writing
Conducting research for a formal writing assignment	120 minutes granted per page of writing

Table 3
APUS Contact Hour Requirements by Academic Classification

Academic Classification	Level of Study	Academic Hour Requirements
Lower Level Undergraduate	100-200 Level	120 Combined Homework and Contact hours
Upper Level Undergraduate	300-400 Level	130 Combined Homework and Contact hours
Graduate	500+	150 Combined Homework and Contact hours

Table 4
APUS Course Information Example

Course Information	Calculated Contact Hours	Course Material Information
Course Title: PBHE528	Total Contact Hours: 145.46	# of Pages Read: 200
Length of Course (in weeks): 16	Class Level: Graduate	# of Words: 50,000

Table 5 shows an example of the first section of the spreadsheet containing the specific requirements for In-classroom contact hours, including (1) the number of hours; (2) the Carnegie contact hours; and (3) an explanation aiding the faculty member in determining the appropriate information to calculate.

The second section of the spreadsheet (Table 6) is the contact hour calculation spreadsheet for Homework Time. As previously mentioned, contact hours for Homework Time are based upon several factors including: (1) length of course; (2) number of discussion boards; (3) number of words for initial posting; (4) number of words required for responses; (5) minimum number of responses; (6) reading of instructor's feedback; (7) quizzes; (8) lecture notes; (9) links to external websites; (10) midterm exam; and (11) final exam. Displayed in Table 6 are example contact hour calculation summaries of the assignments and course information including the final determination if contact hour requirements were met.

Judgments regarding each course are standardized and these standards further serve as criteria for new course development. If enhancements or deficiencies are identified in the course review process, the faculty member is designated to make the agreed upon changes within a specific time frame, and the course(s) is reviewed in a subsequent review process to ensure it conforms to the APUS academic quality standards.

Implications

Alignment of institutional missions, visions, and core values to infrastructure, technological, and pedagogical frameworks—all according to regulatory changes—can be a daunting task; however, careful consideration and alignment at all levels must be made to ensure a high level of quality in online courses.

Roschelle, Pea, Hoadley, Gordin, and Means (2000) reiterate the rationale that is analogous to the importance of alignment by stating that "One of the biggest barriers to introducing effective technology applications in classrooms is the mismatch between the contents of assessments and the kinds of higher-order learning supported most effectively by technology" (p. 91).

Although there are many aspects to consider regarding the varied trajectories that technological and pedagogical change could take, the U.S. Department of Education's (2010) adoption of new regulations regarding an institution's eligibility to award academic credit put an end to ambiguity regarding programmatic integrity. Specifically,

the regulations set forth are two-fold: 1) a federal definition of the credit hour applicable to eligible institutions and 2) requirements for accrediting agencies, as a condition of their recognition, to review the institution's policies and procedures for determining credit hours and the application of those policies and procedures in practice, using the federal definition.

While the contract hour calculator was developed to quantify the interactions that comprise the online learning experience, it paradoxically has the potential to move learning away from the process-oriented paradigm. Specifically, there have been numerous calls to place more emphasis on measures of mastery than on time on task. However, federal regulators have been reluctant to embrace this concept, as mastery remains an ill-defined concept prone to manipulation by unscrupulous entities. Here, the contact hour calculator has the potential to establish a baseline of interaction against which normative measures of acquired proficiency could be correlated. In other words, once an institution has ensured that an adequate activity base has been established, they would then be free to concentrate on assessing students' acquisition of knowledge. Thus, in a rather ironic fashion, thorough mapping of courses, vis-à-vis the contact hour calculator, has the potential to facilitate the emergence of more constructivist means of assessing learning.

SUMMARY

Within the context of higher education as a whole, Allen and Seaman (2011) posit that student enrollment in online courses currently exceeds 6 million—indicating that nearly one-third of all students in higher education have taken at least one online course in the most recent year. Also reported was that online enrollments have shown signs of slowing, but the growth of online enrollments continues to exceed the growth rate for enrollments of the entire higher education population. With these burgeoning numbers of students taking online courses, and in response to the previously mentioned governmental regulations, higher educational administrators would be well advised to re-examine and re-evaluate how contact hours are assessed and calculated in online programs. The authors of this study found no evidence in the literature of a contact hour model or technique to calculate contact hours in a distance education course; therefore, the development of the APUS Online Contact Hours Calculator will undoubtedly aid administrators toward providing some form of direction toward establishing guidelines in this regard.

Table 5

APUS In-Classroom Contact Time Calculation Spreadsheet Example – Part I

Course Information	Calculated Contact Hours
*Course: CMRJ205	Total Contact Hours: 141.28
*Length of course in weeks: 8	Class Level: Lower Level Undergraduate

Complete the Starred Areas (*)

Difference for Contact Hours: 21.28									
In-Classroom Time									
*Number of Students:		14							

Requirement	How Many of Each		Carnegie Contact Hours	
Number of Discussion Boards	*7			
# of Words Required for Initial Posting:	*500			
Initial Posting by Student:	*7	*280	5.6	3.96%
Reading Discussion Board Postings:		*19.44	35.39	25.05%
# of Words Required for Responses:	*250	*420		
Minimum # Required Number of Responses:	*2	*14	8.4	5.95%
Reading Instructor's Feedback	*10	*10	2	1.42%
Quizzes	*4	*60	4.8	3.40%
Weekly Lecture Notes	*8	*50	8	5.66%
Links to External Websites		*20		
Midterm Exam		*180		
Final Exam	*1	*180	3.6	2.55%
Total Contact Hours			**67.79**	
***# of Contact Hours Per Week: 8**				

Note: * Denotes areas the instructor must complete

Table 6
APUS Homework Contact Time Calculation Spreadsheet Example – Part II

Outside-of-Class Time						
# of Students: 14						
Requirement		**How Many of Each**			**Carnegie Contact Hours**	
Are all course materials electronic?		*1	*180			
# of Pages Read in Course Materials		*500	*694.44		13.89	9.83%
Formal Writing Assignment Quantity		*2				
Writing Calculation:					6.8	4.81%
Researching Calculation:					19.2	13.59%
Writing Preparation Time:					4.8	3.40%
# of Misc. Assignments			*0			
Student Studying/Preparation Time:						
Mid Term Preparation			*0			
Final Exam Preparation:			*0			
Final Exam Preparation (w/o Midterm)			*1200		24	16.99%
Quiz Preparation:			*240		3.8	3.40%
Total Contact Hours					**73.49**	
# of Contact Hours Per Week: 9						

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