Transition from Traditional Courses to Time-shortened Courses – New Initiatives in the Construction Technology Discipline

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Abstract

Intensive or time-shortened courses taught outside the traditional semester or quarter system format are becoming increasingly common in many colleges and universities across the United States. The primary reason for this transition from traditional courses to flexible format courses is due to the increasing number of non-traditional students. Intensive, short duration courses are convenient to these students who are attempting to complete school while maintaining full-time jobs and family life. However, many educators are concerned with the "learning outcomes" of such non-traditional courses and quite often the perception of both the faculty and students is that these time-shortened courses some how lack the academic rigor of the more traditional courses. This paper addresses the teaching techniques for intensive courses, the use of such courses in the construction discipline, and the student and faculty perceptions of these courses.

I. Introduction

Indiana University – Purdue University Indianapolis is a comprehensive urban university located in the heart of Downtown Indianapolis, Indiana. As is the case with other urban colleges and universities, a significant number of students enrolled are "non-traditional", adult students. The average age of the student body is approximately 26 years. These adult learners face particular challenges in attending school set in a traditional semester (or quarter) format due to job conflicts and family responsibilities. Increasingly, these students are challenging the universities to offer flexible avenues of learning. One such innovation is "distance learning". Many universities and colleges have made significant investments of time and resources to uniting instructor and the learner with the use of Internet media to establish a connection to create a learning opportunity without the constraints of time or place. Literature review[1, 2] indicates that over the period of five years (1993-97), the Internet offering of courses has doubled each year. The reasons for distance learning are quite compelling and many colleges and universities across the US have embraced it at various levels of engagement and with varying success. Distance learning is but one tool in the arsenal of weapons utilized by educational institutions as a means of providing flexible access to learning. In the School of Engineering and Technology, IUPUI, over a dozen courses are currently offered via the internet, some are strictly web-based while others requires some class-room participation.

Another format rapidly gaining favor not only at IUPUI but also across the nation is the use of intensive, or time-shortened courses. In a recent survey by Nixon[3], data drawn from 424

colleges and universities found that 217 were using accelerated courses and programs. Though there is concrete evidence to demonstrate that college courses must meet several times a week for 10 to 15 weeks in order to achieve an educationally valuable experience, many faculty and administrators have reservations and concerns with such course offerings. Although students generally favor an intense format, faculty opinion leans towards trivializing these courses. The prevalent belief is that time-shortened courses substitute academic rigor and genuine learning for student convenience[4].

Despite such misgivings, intensive courses will continue to flourish primarily due to the student demographic needs. According to the data from the National Center for Education Statistics[5] approximately 50% of all college students in the United States are 25 or older, a 50% increase in the past 20 years. In addition, the numbers of part-time students have also increased significantly[6]. The second reason, for intensive courses is that it allows the institutions to make better use of their facilities, especially when the time-shortened courses are offered during the traditional down times, such as inter-sessions and weekend college. With most colleges and universities feeling the crunch of class and laboratory space (and even parking), time-shortened courses offer a solution. The Purdue School of Engineering and Technology, IUPUI, offered the first intensive course in 1998 and today, there are almost a dozen offerings of such courses across the various disciplines. This paper will present some research comparing the traditional length courses to those taught in a time-shortened format, and discuss how this transition will be made in the Department of Construction Technology, IUPUI.

II. An Overview of Time-shortened Courses

Time-shortened courses are actually not a new phenomenon[7]. After all, summer session offerings of courses, has been around for almost 80 years. Initially such courses were offered to students who may not have achieved the necessary academic credentials during the regular semester to be promoted to the next level, as an additional opportunity to "make-up". Over time though, the offerings became more frequent and varied, thus allowing students to complete their degrees expeditiously by taking summer-offerings. In most cases, the Schools of Education8, which began offering intensive training, led this effort and courses for designed to accommodate teachers seeking advanced degrees, certification, or other credentials.

During World War II, the United States and British Armies developed intensive language training programs[9] that proved to be extremely effective in training interpreters required during the war efforts. The success of this format suggested that an intensive course could be important, educational alternative.

One could even argue that the quarter system is but one aberration of time-shortened courses. Historically, the development of the quarter system was based on much of the same reasons that today school boards in various communities, large and small, in the United States are opting for year-round schools, namely – school over crowding. Quarter-system came into its own after World War II, as many veterans returned to school on *GI Bill*, causing over crowding of colleges and universities. Initially, this did not prove to be very popular, especially with the traditional students who were accustomed to long summer breaks during which they could work and earn money for the school year. However, another benefit that was not evident previously, was soon

apparent – students seemed to retain their knowledge better in a time-shortened format. The long summer break often proved quite detrimental to learning, as students tended to "forget" the material upon their return from the break.

Yet another format of intensive-courses, that came about in the late 70's is *modular-offerings* of classes. An institution utilizing this type of schedule typically establishes short, intensive sessions throughout the academic year. Students take a number of prescribed courses consecutively within the academic year. While there is recognition that block scheduling offers more intensive instruction and increased student focus on subject matter, nevertheless there are concerns that some subjects require more time for absorption of the content and may not be conducive to this format.

Another phenomenon of the late 70's and early 80's was the proliferation of *weekend-college*. Thousands of adult and part-time students who otherwise would not have availed themselves to educational opportunities were drawn into college when these institutions began offering weekend courses on Saturdays and Sundays in an intensive format.

In the late 80's, many professional schools such as Business Schools began offering programs that allowed working professionals to obtain MBA degrees without forsaking their jobs and returning to school on a full-time basis[10]. These Executive Degree programs proved to be highly successful and they proliferated in many urban campuses across the US. Today, just about every Business School has an Executive MBA program that utilizes short intensive periods of on-campus instruction, typically 3-4 weeks a year, combined with correspondence work. Other schools and programs especially in the field of Physical Sciences (e.g. Nursing, Rehabilitation, etc.) soon followed suit.

Schools of Engineering and Technology have been slower to give up the "thinking within a box" and adopt the more flexible formats of teaching and learning[11]. While this is understandable with regard to the time-constrained courses, surprisingly it is also true with regard to the more "technology oriented" courses such as multi-media based courses and web-based courses. Research of the literature bears this out. A study conducted by Petrowsky[12] determined that intensive courses were generally concentrated in the area of fine arts, education, language, social sciences, physical sciences, and business. They were less likely to be seen in professional fields such as law, medicine, and engineering.

III. Time-Shortened Courses – Perceptions and Reality Regarding Student Learning

While time-shortened courses provide a convenient alternative to traditional semester long classes, many educators question whether or not this format allows students to *process* material addressed in class. Despite such concerns, most research indicates that student test scores from intensive courses are favorable comparable to scores from traditional semester long courses.

An important issue related to intensive courses is whether they offer a long-term impact on learning. This is where research does not offer any definitive answer. In fact the results are mixed and even conflicting. In one study[13] involving two groups of students in business administration classes, taught by the same instructor, evaluations of achievement were conducted

immediately following the course, and again through a post-test that was conducted nine months later. Researchers found no significant difference in the two classes in terms of the differences in the scores for the two tests. That is to say, in terms of retention of the material covered in the courses the scores were similar for both the traditional and the intensive courses. However, the researchers also noted that the average scores of the intensive format group of students were slightly higher. Waechter[14] studied two groups of students from an earth science class offered in two formats: nine week and sixteen week. Each class had the same instructor and the same total instructional time (contact hours). A pre-test and three posttests were administered to the two groups. The post-tests were administered following the end of the course, three months later and the final one about four and half months after the class. The research found no difference in the short-term or long-term scores between the groups and concluded that the two formats produced equivalent outcomes of student learning. A similar study involving three groups of students taking a macroeconomics course in traditional 15-week format and a two-week summer session, aimed at comparing student experiences, satisfaction, and academic outcomes. The study determined that while the summer students performed better in traditional format students on unit tests from the first half of the course involving basic recall of material, these students performed comparatively sores on comprehensive exams in the second half of the semester. Summer students also perceived the two week course as more stressful and were overall less satisfied with it than the semester long classes.

Messina[11] collected data from 91 students who took weekend courses in a community college. The author determined that the end of the semester grades were comparable to similar classes taught during the regular academic year.

Despite all of this data and research, serious issues remain unresolved, especially in the mind of the faculty. Tracey[4] surveyed faculty teaching at a large state research university. The authors' findings suggest that faculty tended to disapprove of courses that lasted less than five weeks in duration. The primary reason cited was that the faculty was not convinced that these short courses afforded enough time for the students to synthesize the information. In contrast, the faculty who actually taught shortened duration courses actually preferred such a format, believing that it allowed for more in-depth discussions and experiential activities during class.

IV. Making the Transition from Traditional to Time-shortened Courses

There is presently a paradigm shift in engineering-technology undergraduate education. Citing modern trends, such as a new global economy, and growth of information technology, the Engineering Deans Council and Business Round Table[15] issued a report asking engineering-technology educators to "re-examine their curricula and programs to ensure they prepare students for the broadened world of engineering work". Engineering Criteria 2000, the accreditation criteria established by Accreditation Board for Engineering and Technology (ABET), formalizes this process by requiring that engineering-technology programs be able to demonstrate that their graduates have, among other capabilities, an ability to function on multi-disciplinary teams, an understanding of professional and ethical responsibility, an ability to communicate effectively, the broad education necessary to understand the impact of engineering solutions in a global/societal context, and a knowledge of contemporary issues.

It is in meeting these challenges that the Department of Construction Technology, Purdue School of Engineering and Technology, has decided to offer a three-week, intensive course, in place of the traditional semester long course. The course selected for the purpose is *CNT 105 – Introduction to Construction Technology*, a three credit course, required of all of the new, incoming, first year students.

Initially, this course will be offered as an option, and if proven successful, all sections of the course will be offered in this condensed format. Research conducted by Brown[7] claims that intensive courses should be offered only at the upper division level since at this level, students are likely to be more mature, more focused, and more likely to be familiar with basic information of the discipline. However, other studies indicate that time-shortened courses are equally applicable in earlier years. In fact, a closer analysis reveals that the success of such endeavors is predicated not by the level of the course offering, rather by the inclusion of certain key elements namely,

(1) Careful organization of the course material including syllabi, handouts, reading assignments, etc.;
(2) Varied approaches and teaching techniques; and
(3) Unique outcomes perceived by the students.

According to a survey conducted by Allen[18] of faculty teaching intensive courses from 36 colleges nationwide, determined that these instructors were more likely to utilize creative activities including individual and group projects, experiential learning and off-campus service-learning, all of which form important ingredients of the newly proposed course in construction technology.

V. New Approach to the CNT 105-Introduction to Construction Technology Course

The primary objective of this three-credit, lab-based course is to expose the first year students, to the world of construction through classroom lectures; field trips, videos, and guest speakers. Additionally, the course emphasizes communication, critical thinking, and problem solving.

An important aspect of this course is engaging the students in common, community based responsibility. In this case, construction of a home for the *Habitat for Humanity of Greater Indianapolis*. The selection of the Habitat for Humanity organization was in keeping with the fact that typical Habitat project is "fast paced" and despite the limited time (8 hours) that a student is required to spend on the project, he or she is exposed to various facets of construction. The specific learning objectives in this course targeted by service activities are:

- Achieving "breadth" of knowledge in the field of construction,
- Developing skills to understand, accept, and relate to people of different background, and
- Ability to think rationally, form informed opinions, and comprehend new ideas.

A particularly important aspect of any service learning course is the opportunity given to each student to "reflect" and thereby gain a significant understanding of the course content.

Students in the intensive format of the CNT 105 course will be required to complete the assignment ahead of time and keep a log of the activities. In addition, independent readings such

as *No more Shacks* by W. Fuller, Founder of Habitat for Humanity, will be assigned. The instructor and a student mentor will facilitate the "hands-on" project participation. Students will have the opportunity to interact with others from the class, thus developing acquaintances and possibly even forming bonds prior to the beginning of class. Students will be required to submit a paper on the first day of class based on their experience and their reading assignment.

Usually, in a traditional format, students in this class are exposed to the various roles and responsibilities of individuals participating in the construction process, through the use of videos and guest speakers. A second requirement of the students participating in the time-shortened course will be to have small groups of students (2-3 per group) shadow a construction professional, such as an architect, engineer, contractor, construction manger, interior designer, etc. Typically the group will spend half-day in an office environment and half-day at the construction job-site. Students will be expected to sit in on meetings, observe the workings of the office, and thus develop a sense of the place and the profession. The students will maintain a log and supplement this by an independent reading. Once again, the Instructor will facilitate this experience.

Third and the last, the final project in the course, namely where the students have to track a construction project over the duration of the semester and create a portfolio containing a photographic progression of the project, interviews with the contractor and Construction Manager, and a write-up of the construction process, will not be feasible in the shortened format. The students will be expected to complete this post-class and turn in six weeks after the completion of the course.

The rest of the course content can be easily adapted to this time-shortened format. To ease with this adaptation and to provide additional student learning opportunities extensive use will be made of Web based learning tools. Currently "Oncourse-Online teaching and learning environment" developed by Indiana University is used to enhance communication among class members. The use of this tool will be extended to provide course specified on- line learning tools, and resources.

VI. Conclusions

It would seem that a variety of courses from different disciplines, including those in the engineering and technology fields could be appropriately taught in a time-shortened format. Teaching these courses in flexible time format is not recently a new innovation, but increasingly gaining in popularity as it makes higher education more convenient for the working adults, which are returning to colleges and universities in increasing numbers. Research in the subject to date indicates that time-shortened courses appear to offer benefits to both students and the institutions.

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