Engaging the "Single Path" Challenge in Core Courses: The Impact of Instructional Technology on Individualized Learning

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Request for course release
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I have reviewed the proposal and I support the request for a course release/cost reimbursement for the project.

Richard Baskerville
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Engaging the "Single Path" Challenge in Core Courses:
The Impact of Instructional Technology on Individualized Learning

The reliance on core courses is a long established practice within Robinson College’s undergraduate and MBA programs. These courses are the vehicle by which students are exposed to the principles and practices comprising the knowledge base for a functional area of business. However, students and faculty face three significant challenges when immersed in the implicit single path assumption (i.e., “one size fits all”) inherent in the core course model: student diversity, instructor diversity, and the common course delivery vehicle.

Core Course Challenges

Student Diversity  The typical core course’s student mix challenges a “one size fits all” content and learning assumption in the following ways (Figure 1): (1) Academic area majors are mixed with non-majors amidst processes designed to disseminate an area’s common body of knowledge. Majors often seek to move farther into the knowledge area and at a faster pace. In comparison, non-majors often seek to progress at a pace deliberate and manageable to them. There is a distinct contrast between those seeking breadth and depth and individuals struggling with initial assimilation. (2) Students vary dramatically in functional area experience. Some have achieved a “professional” status in the area while novice newcomers (i.e., "newbies") are gaining a first exposure to principles. (3) Students of course also differ in interest within the subject area content, usually along a readily visible continuum, such as familiar quantitative/qualitative, theory/application, or managerial/technical dimensions.

Not addressing these diversities and adhering to single path learning is costly. According to International Society for Technology in Education (ISTE) studies, it prevents higher achievements for all (see Figure 2).

Instructor Diversity  In principal, the core courses are supposed to disseminate equivalent knowledge across course sections. This is why a coordinator designs the course outline, instructional material, and teaching aids that all regular and supplemental faculty are expected to use. In practice, however, the level of knowledge exchanged varies substantially across sections. The variance may be greatest in those sections where “supplemental” adjunct faculty, part-time lecturers, or graduate teaching assistants serve as the principal instructor. Students quickly learn that while equivalence may be an objective, it is not a reality. Both student evaluation of instructor (SEIP) measurements and informal chatter among students contain compelling evidence of the variability between sections. Unfortunately, sectional differences do not address the need for the diverse learning paths outlined in preceding section.

Course Delivery Vehicle  A variety of new instructional technologies have been introduced over the past decade or so, including the Internet’s Worldwide Web, WebCT, and PowerPoint. However, these instructional technologies typically are not applied to trigger innovations in course content. They generally serve as no more than static and weak accompaniments that do not supplement lecture content. Often they do little more than reduce the level of student note-taking during lectures and discussion.

Online courses too are frequently replications of regular classroom-based courses (often designed by the same faculty member) and follow traditional academic practices (e.g., linear syllabus, assigned out-of-class readings, and traditional student evaluation methods). Often the only change is a movement from place to space (that is, from a place, called the classroom, to a location in the Worldwide Web’s cyberspace).

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Faculty reasons for not institutionalizing innovative applications of instructional technologies or personalizing student learning vary among individuals. Reasons include limited awareness of the available tools, unfamiliarity with their use, limitations on personal development time, and lack of compelling evidence that significant differences can be achieved.

On the other hand, my research on innovative educational technology (supported by a Robinson Instructional Innovation Grant) found, with statistically significant levels (at 0.05 or better), that:

- Students welcome meaningful innovations in learning
- Interest in topics increases
- Information exchange improves
- Effective instructors become even better instructors

Moreover, I have found that the capability to produce these results can be transferred effectively to other faculty members.

Objectives

This project will assess the impact of using digital instructional technology to create and deliver content-based learning modules where each module contains alternative learning paths. Students will be able to follow the path that meets their individual needs. The content areas chosen for this project will have widespread applicability to multiple core courses within Robinson College, spanning such areas as corporate strategy, marketing and retailing, supply chain operations, management, and computer information systems.

A set of interactive, multimedia minicases will be created along with accompanying instructional technology supplements. The supplements will include (1) interactive digital tutorials, (2) digital video presentations, (3) digital animation of business concepts and processes, and (4) interactive photographic presentations with accompanying "voice over" audio.

The system to be evaluated will enable instructors to create and deliver these pedagogical aids via independent Web course sites, Web CT, or Blackboard course sites. Moreover, these applications will be suitable for application in classroom settings or for online or distance learning courses.

This project seeks to achieve the following student and faculty objectives:

Student Objectives

1. To gain insight into the desirability and feasibility of multiple student learning paths in courses comprised of diverse major/non-major, experienced/experienced, professional/novice students with respect to the course’s functional knowledge focus.
2. To stimulate and validate increased understanding of key business concepts by undergraduate and graduate students through use of educational technologies that augment traditional learning processes.
3. To improve the richness of student educational and learning experiences via incorporation of interactive multimedia and digital supplements accessible both during class and for out-of-class study sessions.
4. To expand the role of WebCT, the Worldwide Web, and online course delivery systems as a vehicle for personalized, interactive learning.

Faculty Objectives

1. To stimulate consideration of the varying student differences, backgrounds, and skill requirements in core courses, with the intent of providing multiple learning paths
2. To increase the awareness of and stimulate use of already available instructional resources that capitalize on interactive, real-time teaching tools suitable for use in multi-section core courses.
3. To demonstrate and facilitate instructor experimentation with a wide array of student-accessible multimedia tools (including digitized video, digital streaming video, and digital animation) that can be applied on WebCT, the WorldWide Web, and online other instructional platforms.
4. To transfer knowledge of how to readily create, capture, edit, and incorporate conventional and digital video and audio into online courses, classroom presentation, and student-accessible resources.

Knowledge transfer will be directed at regular faculty, instructors, and graduate teaching assistants.

Jim Gern: Instructional Proposal, Summer 2004
Method
The project will consist of three stages:

1. Creation of Multi-path learning modules—As indicated earlier, a set of minicases will be created for use in the learning process. For purposes of this project, a minicase will have the following characteristics:
   - Four to eight typeset page description of a problem, issue, or practice at a well known company.
   - Places student in position of having to apply principles and concepts relevant to the course module.
   - Structured so that can apply varying levels of expertise and interest. Depending on need and interest, individuals can apply core concepts at the managerial level or delve into the technical underpinnings.
Each minicase will be augmented with information presented using the following instructional tools:
   - Interactive digital tutorials on the topical subject of the case (including audio narrated PowerPoint slide tutorials or digitally animated demonstrations)
   - Company information (Online, digital video providing 'on site' viewing of its business processes)
   - "Live" Presentations by company executives captured for replaying online or via DVD
2. Classroom Testing—During Summer and Fall terms (2004), the impact of using the instructional technologies and minicases will be tested to document the viability and value of alternative learning paths. Multiple sections of the core course in information systems (MBA 8473 and the new MBA 8120) will participate in the testing process, each using varying forms of the learning modules. Six to eight sections of the core MBA information systems course are offered each term. Hence, there is ample testing opportunity.
   - The core course in information systems has been selected because it is especially problematic to deliver, a direct result of the typical range of student variations (see Figure 1) and instructor combinations.
   - While the content of the course is determined by the MBA program committee, the choices of pedagogy and delivery methods are under control of the instructor. The challenging combination of student, faculty, and pedagogy provides an ideal setting for evaluating the influence of the instructional innovations.
3. Evaluation—During the summer and fall term, at least four sections of the course will be offered using alternate pedagogies in the designated content areas described above. Some sections will have the traditional course without the additional pedagogies. In other sections, the online, individualized learning modules will be introduced. Instructor participation from regular faculty has been arranged. I will work with the instructors to identify the sections where the innovation will be applied for evaluation purposes.
   - The impact on individual performance in the sections will be evaluated in the following way:
     a. Insertion into course examinations common questions that are directly focused on the information conveyed through the online tutorials.
     b. Capturing data on the number of times the online tutorials and cases are visited/viewed by students in the designated sections (applies to the treatment group)
     c. Correlating performance on exam questions between treatment/nontreatment sections
     d. Student completion of a formalized questionnaire, consisting of both structured Likert scale and open-ended questions, evaluating (1) characteristics of interactive learning supplements; (2) perceived impact on understanding of content; (3) desirability for similar innovations in other Robinson courses.
     e. Correlation of student course evaluations as measured by Robinson College SEIPs.
     f. The alternatives having the greatest impact on students in areas such as aide to student understanding and comprehension; ability to transfer and principles and practices to other situations.
     g. Tools and pedagogical approaches judged to have most feasibility for transfer to other instructors.
     h. Barriers to efficiency in applying instructional technologies for creation of multiple learning paths.
Transfer of Knowledge
If the Faculty Development Committee deems it appropriate, the transfer of knowledge from this project will be accomplished through:
1. A faculty development workshop focusing on transferring the procedures and methods for repeating these innovations in other courses.
2. An illustrated guide book and manual that faculty can use independent of the workshop.
All necessary equipment, software, and materials needed to complete this project have been arranged.

Jim Seem. Instructional Proposal. Summer 2004
References
