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Using the Madeline Hunter Direct Instruction Model to Improve Outcomes Assessments in Marketing Programs

Michelle D. Steward[1], Gregory S. Martin[2], Alvin C. Burns[3], and Ronald F. Bush[4]

Abstract

This study introduces marketing educators to the Madeline Hunter Direct Instruction Model (HDIM) as an approach to significantly and substantially improve student learning through course-embedded assessment. The effectiveness of the method is illustrated in three different marketing courses taught by three different marketing professors. The results demonstrate double-digit improvement in student achievement. Examples of application exercises are provided. The HDIM offers a viable tool for use in an environment in which marketing faculties are increasingly required to demonstrate course-embedded assessment as part of annual review, promotion, and tenure processes.

Keywords

teaching model, HDIM, marketing education, Hunter method, course-embedded assessment

The "Eligibility Procedures and Accreditation Standards for Business Accreditation" (Association to Advance Collegiate Schools of Business [AACSB], 2006) call for colleges of business to define their standards and concomitant outcomes-based assessment procedures. The overall goal is evaluation, which is defined as a "systematic investigation into the worth or merit of an object" (Joint Committee on Standards for Educational Evaluation [JCSEE], 1994, p. 3), and AACSB's application of evaluation to business schools is program evaluation, the set of activities undertaken to determine whether an educational program is achieving its desired goals (JCSEE, 1994). An ongoing assessment plan offers the framework to continuously "fine-tune" the effectiveness of student learning experiences. Also, it offers the opportunity to try new, innovative teaching techniques with a ready-made system in place to evaluate the results of the pedagogical "experiment." The purpose of this article is to examine the effectiveness of a course-level, research-based teaching technique—the Madeline Hunter Direct Instruction Model (HDIM).

For many schools, the unit of evaluation for AACSB accreditation is the program as a whole (e.g., bachelor's degree programs in various business disciplines—marketing, management, finance, accounting, etc.). However, assessment at the course level is necessary to ultimately affect outcomes at the program level (Shaftel & Shaftel, 2007), as course-level learning combines to produce program-level learning. In other words, achievement of key course-level outcomes is a necessary condition for achieving program-level outcomes. Furthermore, a stated course-level outcome typically, and often implicitly, embodies several "suboutcomes" describing relatively tightly defined modules of knowledge or skills that make up the content of day-to-day instruction in the course.

Consider, for example, the following simple hierarchy of learning outcomes:

Marketing program-level outcome:
> The student should be able to create, develop, and evaluate theory and data-driven marketing strategy appropriate for a given economic environment.

Retail Strategy course-level outcome:
> The student should be able to analyze and evaluate the basic financial practices and health of a retail firm.

[1]Wake Forest University, Winston-Salem, NC, USA
[2]Northern Kentucky University, Highland Heights, KY, USA
[3]Louisiana State University, Baton Rouge, LA, USA
[4]University of West Florida, Pensacola, FL, USA

Corresponding Author:
Michelle D. Steward, Wake Forest University, P.O. Box 7285 Reynolda Station, Winston-Salem, NC 27109, USA
Email: stewarmd@wfu.edu

A sampling of implicit "suboutcomes" for the above Retail Strategy course outcome:

> The student should be able to define appropriate retail-oriented financial ratios and indicators; explain the components of a retailer's Income Statement; prepare a merchandise budget for a retailer, construct a retail firm's strategic profit model; and so on.

The dominant view of learning that informs the writing of learning outcomes in the above manner is Bloom's Taxonomy of Educational Objectives (Bloom, 1956). The Taxonomy is a common language used to describe a cognitive hierarchy of educational goals (from lower to higher levels: Knowledge, Comprehension, Application, Analysis, Synthesis, and Evaluation[1]). The assumption driving the hierarchy is that a student must achieve specified "knowledge"-level outcomes before he/she is capable of exhibiting "comprehension"-level behaviors, and so on. Thus, students must have learning experiences at each level, progressively. At the program level, we commonly write learning outcomes, appropriately, at a high, evaluative, level. In most, if not all, of the courses we teach, we also strive for this level. But, following Bloom, to Analyze, Synthesize, and ultimately, Evaluate, students must master relevant tightly focused concepts at lower levels in order to have the knowledge and skill "building blocks" to engage in higher-level cognition.

One of the challenges in successfully implementing a closed-loop assessment system for continuous improvement at the program level is identifying and targeting specific instructional actions that will lead to improvements in overall student performance. Think of this process as analogous to improving customer satisfaction with a product—what specific tactical action(s) can a firm implement that will influence overall satisfaction? As with the firm, we must identify and target change in specific influencers. In other words, we must, at least initially, focus our improvement efforts on lower level "suboutcomes" to bring about improved performance in higher-level cognitive skills measured at the course and program levels.

The problem, then, is twofold—(a) determining what lower-level "building block" topics are hampering performance at higher levels because they are insufficiently mastered and (b) determining what sort of focused action(s) by the instructor will act to increase student mastery of these key knowledge areas or skills. This article does not address the first, diagnostic issue in a structured manner, as that issue is most often idiosyncratic to specific courses and how unique learning outcomes are written. Rather, we focus on the second issue: Assuming an appropriate diagnosis, what pedagogical techniques are most effective in increasing mastery of well-defined knowledge areas or skills?

We examine the effectiveness of one such research-based teaching technique—the HDIM. After a review and discussion of the HDIM from theoretical and applied, empirical perspectives, we examine its suitability for and use in post-secondary business education. We then pose a research question and describe and provide the results of three quasi-experimental studies of its effectiveness in a range of marketing topic areas. We discuss the results and limitations of the studies before offering some practical observations on using the HDIM in the marketing classroom.

The Hunter Direct Instruction Model

Madeline Cheek Hunter (1916-1994) is recognized as one of the 10 most influential women in education and among the 100 most influential women of the 20th century (Goldberg, 1990). A professor of educational administration and teacher education at University of California, Los Angeles, Madeline Hunter published *Mastery Teaching* in 1982. In it, Hunter described her seven-step teaching technique known as the HDIM. The HDIM concept presented in her book became what is arguably the most well-known approach to teaching (Sardo-Brown, 1990). Her book has been referred to as "starting an industry." "Her 'principles of instruction' have been adopted by thousands of teachers and hundreds of school districts across the land. People trained in the model speak of being 'Hunterized'" (Goldberg, 1990, p. 41). In addition to *Mastery Teaching,* Hunter published several other books, and *Mastery Teaching* continued to be printed after her death. Not only has the HDIM been one of the mostly widely adopted models for lesson plans in K-12 settings, but it also is used in other amazingly diverse instructional settings. To name a few: National Park Service outreach programs (e.g., National Park Service, 2008), librarians teaching biologists about patents (Church & Carpenter, 2000), high school English (Post, 1987), and principals offering teachers guidance in how to teach (Bushman & Bushman, 2004).

Steps in the HDIM

The HDIM consists of steps that systematically educate students with a goal of mastery of the subject matter (Hunter, 1982). The system emphasizes guided practice that enables students to acquire skill sets that they perceive as being relevant. Ultimately, the educator using this method "certifies" or explicitly validates that the learning has taken place.

The seven[2] steps in the HDIM are as follows:

1. *Anticipatory set*. The educator provides the rationale or a "hook" for students to see the relevance of the learning or to otherwise become receptive to learning the subject matter. This first step must

create a desire or motivation in students to want to learn the subject matter.

2. *Objectives/standards*. The educator identifies specifically what the student will be able to do, understand, and/or care about as a result of the lesson. In other words, the educator communicates what he or she expects the students to learn.
3. *Teaching and modeling*. The educator provides a model or example of what is expected as the end product of the learning. Thus, the HDIM relies heavily on an exemplar or a modeling approach to teaching.
4. *Guided practice*. Students work on activities or exercises relevant to the subject matter under the teacher's direct guidance. This step is critical, as students acquire knowledge by rehearsal geared to the model or example established by the educator in the previous step.
5. *Check for understanding*. The students' practice sets are evaluated by the educator to make sure that they "got it." This step is an evaluation of students' initial and continued attempts to practice the skill or otherwise demonstrate the knowledge involved. The educator points out errors that should be corrected in subsequent practice or praises students for their correct practice of the subject matter.
6. *Independent practice*. Once students have acquired the knowledge, the educator has them repeat the practice to provide reinforcement. An analogy is "taking off the training wheels" or placing students in situations where they must use the newly acquired knowledge on their own.
7. *Closure*. The teacher uses actions or words that communicate to students that they have learned the subject matter. In essence, this step certifies or otherwise provides acknowledgement that the student has gained command of the subject matter to the level of the standards or objectives set by the educator in the second step.

Theoretical Support for the Effectiveness of the HDIM

Instead of just focusing on an input–output examination of effects of the HDIM, we should ask, "Why does the HDIM work? What individual variables are likely operating in the HDIM process?" Second, once we identify these variables, does the literature support positive effects of each HDIM variable identified on learning? We can identify certain variables by examining the steps in the HDIM. These variables include (a) salience of material, (b) communication of objectives (c) modeling or demonstration of outcome, (d) practice of concepts, (e) feedback, and (f) reinforcement. The HDIM incorporates each of these variables. The relevant literature supporting the link to positive learning outcomes for each of these variables is briefly discussed below.

The first step of the HDIM involves explaining the *salience* of the material to the students as a way to position the rest of the instruction. Salience, or relevance, of a topic to a student enhances motivation to learn (Pintrich & Schunk, 1996). Research in educational psychology suggests that students in some cases may even cheat to complete assignments that they deem useless (Van Etten, Pressley, McInerney, & Liem, 2008). Through in-depth interviews with college seniors about characteristics of college courses that encourage motivation, Van Etten and colleagues found students were more motivated to work on assignments that they believed were useful and relevant to their lives.

Communicating the objectives of a given assignment to students, whether in writing or verbally, has been suggested to enhance learning through providing structure and relevance to students and helping students to manage study time by focusing on core objectives (Graeff, 1998). In an early study on the value of informing students of the learning objectives, Kaplan and Simmons (1974) found that explicitly presenting students with the task objectives reduced by 8.7%, on average, the number of examples that an instructor needed to give to help the students understand the material. Stated objectives orient students to the particular area of information deemed critical, and thus can frame information and increase focus on the pertinent material.

The effectiveness of the use of examples to model or demonstrate how to solve problems has been shown across a variety of disciplines (see Carroll, 1994; Catrambone, 1995). Carroll (1994) compared the performance of students who received examples of algebra problems worked through and a practice sheet to those who only received a practice sheet without the example. The results indicated that the group who received the example of how to work problems made 20% lesser errors on the subsequent examination. Tuovinen and Sweller (1999) found that using examples was even more effective when students did not have experience in the topic at hand. For inexperienced students, efficiency and accuracy scores were nearly twice as high in the group who received worked examples as compared with those who did not. The effectiveness of examples may be linked to how examples demonstrate the relationship of concepts and illustrate the procedure to solve problems. The HDIM incorporates instructor-provided examples as a way to model the educational outcome(s) desired by the instructor.

Practice or rehearsal of a newly acquired skill has been shown to lead to stronger skill development (see Hess, 2007). Mills and Pace (1989) found that offering students experience practicing skills in a business communications class increased the change in performance by 17% when compared with students who only received instruction but no

practice opportunity. With the HDIM, practice occurs both in Steps 4 and 6 and is accompanied by feedback from the instructor that allows quick correction and adjustment in the early stages of skill acquisition.

Research in education has consistently demonstrated the value of immediate *feedback* in enhancing learning (see R. C. Anderson, Kulhavy, & Andre, 1972; Paladino, 2008). Feedback offers students information by which to determine the degree of their understanding of material. Even in less direct forms of feedback, students who received information about whether they correctly or incorrectly answered questions on a practice test answered approximately 8% more answers correctly on the formal examination than did those who received no feedback (Butler, Karpicke, & Roediger, 2007).

Finally, one of the key aspects of classical learning theory suggests that timely *reinforcement* is critical to acquisition of new knowledge (Brunner, 1966). In the HDIM, this reinforcement occurs in the final stage when the instructor restates the objectives and communicates the achievement of these objectives to students, reinforcing the core concepts that they have learned in that session. Thus, there is ample reason, based on the literature, to theorize that use of the HDIM will positively affect learning. Saliency, specifying objectives, modeling, practice, feedback, and reinforcement have each, individually, been shown to increase learning. The HDIM offers a systematic framework that incorporates these key variables.

Empirical Evaluations of the HDIM

In the early 1980s, the National Institute of Education conducted several projects designed to measure the effects of the HDIM. The results of the first phase of one project were convincing: HDIM teaching resulted in higher achievement scores in both reading and mathematics between the first and second years and the second and third years of implementation (one mathematics score between Year 2 and Year 3 was higher but not significantly so). These findings were true for regular students as well as students with limited English-speaking skills (Stallings, Robbins, Presbrey, & Scott, 1986). The final phase of the project was a year without the trainers present. Called the "maintenance" phase, teachers were to implement the program on their own. During the maintenance year, the achievement scores went down from the previous years. The assessment by researchers pointed to a variety of possible causes but focused on underestimating the importance of maintaining a training program when the trainers are no longer around (Stallings & Krasavage, 1986). Hunter herself wrote a critical review of the last year of the project (Hunter, 1986) and the failure to maintain the proper controls to ensure that the teachers were properly using the method on new materials and properly implementing the method without the presence of trainers.

One of the most widely cited critiques of the method is that of Mandeville and Rivers (1988), who wrote an assessment of the method applied to a large sample of teachers in South Carolina. Three out of four study objectives showed positive outcomes, though the one objective that was not positive was student achievement. However, the authors and a host of critics stated that the study was flawed in assessing student achievement. While another study assessing the method also showed no positive effects on student achievement (Manatt & Stow, 1986), other research efforts have shown positive results (Dildy, 1982; Rivers, 1988).

The empirical research evaluating the HDIM may be summarized as generally supportive. However, most of the empirical studies have been field studies in which controls were difficult to establish and maintain. If we evaluate the HDIM in terms of acceptance and use by educators, the program has been required in hundreds of school districts and is still popular today. Dr. Dale Hair, education expert, states that the method is presently being used widely in the United States and Canada (D. A. Hair, personal interview with the authors, December 27, 2007).

Application in Postsecondary Business Education

As noted previously, there is widespread use of the HDIM in areas outside of postsecondary business education. This is as expected, as Hunter originally devised the model for primary- or secondary-level lesson planning contexts, where the subject matter is concise and where learning takes place in a relatively short time period, perhaps a matter of 20 minutes, or a series of short time periods covering a week or so. However, as with any durable and effective model of teaching based on fundamental concepts of learning, the HDIM should be highly adaptable to different contexts. In fact, Hunter (1985) claims that it is equally effective in elementary, secondary, *and* university teaching. The HDIM is appropriate for the university setting in that the model identifies key decisions that educators must make regardless of course content or course level. Thus, with a little imagination (and work), the model should be applicable to the teaching of business courses in higher education environments, particularly in situations where the learning outcome has specific, well-defined content (Burns, 2006). However, we can find no published tests of the effectiveness of the HDIM in this context, and only one available investigation of its use.

Burns (2006) offered the first documentation of using the HDIM in postsecondary business education. Burns showed how the HDIM could be adapted for use in a marketing research course even when student teams, working on different live cases, were faced with widely differing marketing research situations. While Burns illustrated that the HDIM could be successfully implemented, there was "no rigorous comparison of the learning under this method with alternative

methods" (p. 290). This gives rise to the research question that we address in the remainder of this article:

> *Research Question 1:* Will specified learning outcomes be better met by student groups receiving instruction using the HDIM than in equivalent student groups instructed with more traditional post-secondary teaching methods?

We expand on Burns (2006) by showing applications through an experimental design in three different and diverse marketing courses and providing an outcomes assessment-based evaluation of the effectiveness of the HDIM when compared with more traditional methods of instruction used in higher education. We illustrate the use and effectiveness of the HDIM in teaching modules on sample size in Marketing Research, the merchandise budget and open-to-buy (OTB) in Retail Strategy, and final price determination in Principles of Marketing.

Method

Design

Three separate quasi-experiments are conducted in which the use of the HDIM approach is compared with a control group in which the HDIM was not used. For two of the quasi-experiments, the control treatment preceded the HDIM treatment by one semester, whereas for the third quasi-experiment (price determination), the treatment and control conditions occurred in the same semester. Also, whereas three different instructors were involved, the same instructor taught both groups (control and experimental) within each quasi-experiment, thus eliminating the potentially confounding effects of instructor differences.

Care was taken to ensure internal validity of the three studies. First, to demonstrate that "experimenter's hypothesis" or other Hawthorne effects were not producing demand artifacts, two of the three studies used "blind" control groups. That is, the professors teaching the control classes for Marketing Research and Retail Strategy were unaware that they were to subsequently be involved in a study investigating teaching methods. Prior to the experimental semester and as a part of their regular course assessment efforts, both professors had already established outcomes measures that were suitable for use in the experimental classes the following semester. Both professors had taught their respective courses a number of times and both reported that there was nothing unusual about the semester in which the control measures were taken. The third professor taught both the control and experimental classes in the same semester and consequently was not "blind" to the research study. However, this faculty member is fully trained in experimental design and was well aware of the need to maintain a normal teaching approach in the control setting. She/he reported the control condition course was taught using the same method/approaches she/he typically used in teaching the course.

In addition, internal validity was also demonstrated by comparing the student subjects in the control and experimental groups in each course on two variables commonly associated with academic capability and performance: (a) performance on regular examinations in the course (given prior to the introduction of material taught in the HDIM module) and (b) students' cumulative GPAs. Group equivalences were examined using tests of statistical differences, $\alpha = .05$. There were no significant differences between control and experimental groups on examination scores earned prior to the HDIM treatment administration phase of the class (Marketing Research, $p = .90$; Retail Strategy, $p = .88$; Principles of Marketing, $p = .91$). Additionally, no significant differences were found in the cumulative GPAs between control and experimental classes (Marketing Research, $p = .84$; Retail Strategy, $p = .06$; Principles of Marketing, $p = .43$). Thus, in terms of treatment considerations and of the subjects' abilities to master learning under the typical (non-HDIM) approach used by each instructor, the within-experiment groups were equivalent, and the internal validity of the quasi-experiments was supported. Still, we refer to our studies as "quasi-experiments" simply because the design could have contained additional control measures, discussed in a latter section as limitations. Therefore, we recognize that it is difficult to maintain perfect experimental controls in a field study and prefer the use of "quasi-experiments" to describe the current studies.

The control groups (non-HDIM) were taught using traditional approaches used by the instructors in the past, including the use of a combination of lecture, discussion, and homework assignments. Research suggests that lecture continues to be the dominant method of instruction used by university educators across disciplines (Lammers & Murphy, 2002), as well as specifically in fields allied to marketing such as economics (Becker & Watts, 2001). Although the control groups were not taught through "pure" lecture, or only lecture, we believe that the widespread use of lecture does not make our control groups unreasonable.

Marketing Research: Teaching Sample Size Determination

Teaching sample size determination in the basic marketing research course is problematic; students typically do not perform well on tests of this material. Hence, this type of material represents a perfect example of a topic that needs improved instruction and assessment. Although students can calculate the correct sample sizes for basic situations, experience has shown that questions asking for their understanding of the interactions and impact of different components of sample size formulas are routinely troublesome. One of the

Table 1. Applying the HDIM to Teaching Sample Size in Marketing Research

Step	Description
1	*Anticipatory set:* Students were told about several recent research surveys that had been highlighted in the news (this was during the 2008 Presidential Primary season). The author also asked the students what they would think of a survey of the taxpayers of the state's population that concluded that college students should pay much higher tuition. As expected, this received high levels of attention and they were then asked: "Wouldn't you want to know if the sample size used in that study provided accurate data?" They were also told that they would have to make business decisions, some of which could prove to be very important to them, based largely on survey data during their careers. It was explained to them how important sample size is in determining the accuracy of survey data.
2	*Objectives/standards:* Students were then given a set of objectives and standards on which they would be graded. See Appendix A.
3	*Teaching and modeling:* The sample size determination lecture was presented with particular emphasis given to illustrating how a particular concept related to each teaching objective as specified in Step 2.
4	*Guided practice:* Problems were given in class, and students worked on the problems that were similar but different from those presented during Step 3. Students were asked for answers, and the "correct" answers were given. For each problem, there was a discussion as to how the problem was relevant to one or more of the learning objectives.
5	*Check for understanding:* During a subsequent class students were given a set of sample size problems to work. The instructor walked around the class, making certain to see how each student was performing and answering questions. The instructor pointed out errors and guided students to see their errors as well as praised students who were getting the correct answers.
6	*Independent practice:* At the end of Step 5, students were given a handout labeled "Independent Practice." They were told to work on this on their own and to bring it back to the following class to be scored. See Appendix B.
7	*Closure:* The "Independent Practice" was scored. The majority of the students did a very good job and missed none or a few questions. High performers were praised with the message "You have it! Study this material. . . . it may be two letter grades on your test!" (Non-HDIM students were always informed that the same test could contain two letter grades worth of questions from the sample size determination chapter so this message was not unique to the HDIM students. Having the message in written form on the "Independent Practice" was unique.)

Note: HDIM = Madeline Hunter Direct Instruction Model.

authors used the traditional teaching method of presentation of material and assignment of homework problems to teach sample size in a non-HDIM "control" condition in the spring 2007 term. In the following semester (fall 2007), the author developed a teaching approach and course materials to teach sample size consistent with the HDIM, that is, the "experimental" condition. The approach is outlined in Table 1.

Retail Strategy: Teaching the Merchandise Budget and Open-To-Buy

An important topic in the typical basic Retail course is financial and inventory control at the store or department level. The fundamental tool used by all retailers in this effort is the merchandise budget (MB) and OTB system. Teaching the MB/OTB is often a frustrating experience. Students seem to readily grasp the basic concept of balancing cash needs with inventory control but often struggle in their efforts to perform the computational algorithms. The focal course in this study is Retail Strategy, an upper-level undergraduate marketing elective taught as a relatively high-level introduction to retailing strategy and management.

As in the case of the preceding example in a marketing research class, this study provides a test of the HDIM across two semesters—spring 2007 and fall 2007. Spring provided the "control" non-HDIM baseline for evaluating the effect of the HDIM process implemented in the fall. In the fall term, the HDIM method was implemented.[3]

Principles of Marketing: Teaching Final Price Determination

To add external validity, an application was sought that did not include primarily marketing majors. A faculty member at another institution, where all students are "business majors," was asked to participate as a coauthor and was given the same training on the HDIM as the other participating faculty. In this study, the control and experimental conditions were administered in the same semester. Final Price Determination was selected as the teaching module in which to apply the HDIM. During the fall 2007 semester, one class did not receive the HDIM treatment and was taught in the traditional manner, and a second principles of marketing course section in fall 2007 was used to implement the HDIM for instruction of the same subject matter.[4]

Results

In each of the three quasi-experiments, the effect of each approach (HDIM and non-HDIM) was measured by use of a

Table 2. Results of Use of the HDIM

Application Area	Group	Sample Size	Mean[a]	Difference[a]	Significance
Sample size (Marketing Research)	HDIM	30	81.5%	17.5%	.003
	Non-HDIM	29	64.0%		
Merchandise budget (Retail Strategy)	HDIM	25	79.5%/62.8%[b]	16%/13.4%[b]	.02/.09
	Non-HDIM	32	63.5%/49.4%[b]		
Price determination (Principles of Marketing)	HDIM	22	89.3%	23.3%	.001
	Non-HDIM	22	66.0%		

Note: HDIM = Madeline Hunter Direct Instruction Model.
a. Based on quiz grades unless otherwise noted.
b. Based on item in the final examination.

quiz administered shortly after the learning experience. The quizzes varied across courses (Marketing Research, Retail Strategy, and Principles of Marketing) and ranged from inclusion of multiple choice questions with computations required to open-ended questions. The critical point from an experimental standpoint is that the same instrument was used within a course for both the control class and the experimental condition class.

For ease of comparison across quasi-experiments, the quizzes, which are based on different numbers of total points, were converted into percentages of the total points. In one study (merchandise budget), a second effectiveness measure was available in the form of a section of the final examination dealing with that topic alone. Again, this section was based on total points, and the raw scores were converted to percentages. All findings are contained in Table 2.

Table 2 reports the results of the various independent samples' mean difference tests, and it reveals that statistically significant differences were found in all three application scenarios. Moreover, the HDIM mean was found to be superior when compared with the measure of effectiveness in the non-HDIM condition. As can be seen, the HDIM resulted in anywhere from a 16% to a 23% improvement over the non-HDIM approach to teaching the various subject matter concepts. For the quizzes, the difference was significant at the $p \leq .02$ level or lower, and for the additional final exam section comparison in one study, the difference was approximately 13% and significant at $p \leq .09$. The results illustrate higher scores across all courses for subjects taught using the HDIM.

Discussion

The purpose of this article is to introduce postsecondary business educators to the HDIM of teaching and to evaluate its effectiveness in three different applications in three different marketing courses. Each application involved a tightly focused learning module that had been identified by the course instructor as problematic, in the sense that low student achievement in the module content was likely affecting performance on course-level learning outcomes. In all three applications, the HDIM resulted in significantly higher student achievement on assessments identical to those used in non-HDIM instruction for the same topics. It is not surprising that the HDIM outperformed more traditional teaching methods as, as noted previously, the HDIM is widely accepted and used in nonuniversity settings.

What is surprising is the *amount* of increase in student achievement. In this research, we found double-digit improvement even across three different applications with three different faculty members. Typical changes in percentage student scores in experimental designs comparing teaching methods are single-digit movements. For example, the effects of practice testing revealed an increase in scores of less than 5% (Scott & Bush, 2008); effects of teaching online versus traditional format showed less than a 2% difference in student achievement (Wegner, Holloway, & Garton, 1999); using teachers with 1 standard deviation increase in perceived effectiveness increased student performance by 0.5% (Hoffman & Oreopoulos, 1999); enhanced outlining of course material increased test scores an average of 9.97% (Hansen, 2003); and hybrid course delivery versus traditional course delivery achieved a 2% increase in the final grade (Dowling, Godfrey, & Gyles, 2003). Our conclusion is that the HDIM does indeed represent a viable instructional method that can be used to increase student learning and facilitate course-level assessment practices.

Limitations and Future Research

We recognize several limitations in the reported studies. Although we took safeguards to increase the internal validity of our quasi-experiments, we were restrained by the limitation faced in most real-world field studies—lack of ability to randomly assign treatments to individual subjects. To ensure group equivalencies, we used relevant pretreatment testing scores and cumulative GPA and found no difference between control and experimental groups. It would strengthen the demonstration of group equivalency in future field studies in

this area to include other measures such as standardized test scores (e.g., SAT), high school program content and grades, and others typically used by universities to evaluate student learning capabilities.

In terms of external validity, the three studies are cross-sectional in nature. It would be interesting to examine whether the observed HDIM effect remains over multiple semesters. The merchandise budget study shows a decay in knowledge between the module quiz and eventual final exam (approximately a 6-week gap) for both instructional methods but hints at a slower rate of decay for the HDIM group, leading us to think that knowledge acquired through the HDIM technique might be better retained.

Future studies should extend the simple "input–output" model used in the current research and provide a more explanatory model by specifying and measuring additional variables that may moderate HDIM effects, such as student "learning style." In addition, a more explanatory model could also incorporate other dependent variables beyond student learning. For example, it would be interesting to know if the use of the HDIM affects student evaluations of the course and instructor. It would seem that there would be a positive effect because of increased student/instructor interaction in a more active style of learning, and also because student achievement is increased. In other words, would faculty consistently using the HDIM receive higher teaching evaluation scores?

Finally, and perhaps most important, it should be noted that our research design did not encompass measurement of student learning (i.e., assessment) at higher-level course or program learning outcome levels for either the control or HDIM conditions, even though theory would predict improvement, based on the results of the HDIM treatment. Necessarily, a rigorous test to parse out the effects of single-module enhancements on higher-level course outcomes would involve a much more controlled, longitudinal design and, admittedly, more discriminating course-level assessment measures than the participating instructors currently employ. It would also be necessary to assure, or assume, that the diagnosis and selection process for the content module for HDIM application identified one that would have a significant impact on achievement in the relevant higher-level learning outcome. Herein lies one of the most difficult tasks for continuous program improvement through assessment at the postsecondary level. Even at the course level, synthesis and evaluative-level outcomes require students to employ many topical areas of subject knowledge simultaneously, and even experienced, very successful instructors may find themselves using informed guesses as to which topics should be enhanced to provide the largest overall impact.

Notwithstanding the limitations discussed above, our results showed a substantial positive effect on student learning in the HDIM conditions, and it would seem that the use of the HDIM is desirable, given the appropriate context for application as previously discussed (i.e., focused topics that demand a mastery level of lower-level learning to enable knowledge use in achieving higher-level learning outcomes). The final section of this article offers some practical suggestions to implement the HDIM in a marketing course.

Observations on Implementation

The participating instructors in these studies were not experts in the use of the HDIM, but once we understood the concept and process, we discovered that we were already using some of the components of the HDIM in our courses; we just were not doing them in the systematic manner prescribed by the model. Thus, it was not a particularly onerous task to implement the HDIM process and achieve the reported positive results. We offer the following observations, born of our experience, to guide others in successfully implementing the process.

Learn more—the HDIM concept is deceptively simple and proper implementation could be somewhat complex in some situations. We use our seven steps only to summarize the HDIM, and a much more in-depth treatment is available in Hunter (1994), which contains many suggestions on how to implement each step. Also, consider seeking advice from colleagues in your college of education. Not only will your education colleagues know about the "Madeline Hunter Method," they will likely have their own ideas and suggestions about how to properly implement the method in postsecondary environments.

Start in small, carefully selected modules. Inventory the "building blocks" of your course-level learning outcomes and identify one or more distinct knowledge modules that are likely to have a significant impact on outcome achievement and that your students seem to struggle with (based on exam results, etc.). We presented three applications of the HDIM in three areas that we traditionally find to be problematic in our courses.

Before implementing your initial HDIM module, create a method for measuring and evaluating the results. If you find that results are positive, move to the next level of measurement and create a method for determining the impact on the relevant course-level outcome.

Finally, expect the HDIM to take more class time for the focal topic. Developing outcomes, determining how to best present a model of the content, and measuring performance also takes time. It will also lead to better teaching and learning. Technology may be helpful in creating efficiencies that will free classroom time for the use of the HDIM. For example, if you are using online "Webtools" such as Blackboard or WebCT, you might consider placing some traditional lecture material that you normally cover in class online for student self-study. This will help you gain the efficiency needed to devote more time to HDIM elements such as guided practice and providing feedback and reinforcement.

Appendix A

Objectives for Sample Size Determination

What You Should Know About Determining the Appropriate Sample Size

Objective:
1. Be able to articulate what is meant by the appropriate sample size.

How I will evaluate you:
You will be asked to write an answer to the question.

Objective:
2. Know how to use the Confidence Interval Approach formula for calculating sample size for both (a) percentages and (b) means.

How I will evaluate you:
You will be given several case problems and you will be required to use the formula to calculate the sample size.

Objective:
3. You should be able to understand what you are doing when you "plug in" components in the formulas.

How I will evaluate you:
You will be required to determine what the components are and to calculate and/or discuss the trade-offs if you use different values for the components.

Objective:
4. You should be able to articulate what it means to your findings when you use the appropriate method of determining sample size.

How I will evaluate you:
I am going to ask you to write an essay explaining a sample finding (I will provide) just as if you were writing a professional research report.

Objective:
5. Be able to discuss the significance of sample size when you use a nonprobability sampling plan.

How I will evaluate you:
I am going to give you a situation in which data have been collected using a nonprobability sample plan. You will be required to write an essay explaining the sample data given they were collected using a nonprobability sampling plan.

Appendix B

Independent Practice for Sample Size Determination

Sample Size Problems
SHOW ALL CALCULATIONS! Name: _____

Sample Size Formulas:
For Estimating a Percentage in the Population:

$$n = \frac{z^2(pq)}{e^2}$$

For Estimating a Mean in the Population:

$$n = \frac{s^2 z^2}{e^2}$$

Questions:

1. The State of Florida decides that there are too many alligators and that they need to reduce the population each year. Because an alligator is worth about $1,000, they believe they will have plenty of hunters who will want a special permit to trap a gator. They decide to have a lottery to issue 1,000 permits a year allowing the holder of the permit to trap and take one gator. The only restriction is that the gators must weigh MORE than 100 lbs. The Director of Wildlife Conservation is interested in knowing the average weight of the gators that are trapped but doesn't want to require all 1,000 permit holders to bring their gator in for an official weigh-in. Rather, she decides that she will require a sample of the permit holders to bring their gators in to be weighed. The largest gator taken in previous hunts weighed 1,300 lbs.
   A. What size sample does the Director of Wildlife Conservation need for the estimate of the true average (mean) weight of the 1,000 gators taken to be within ±25 lbs. She wishes to be 95% confident in the estimate. Show your calculation here:
   B. Let's assume that the correct sample size was used and a probability sample plan was used. The sample mean of the *X* gators weighed was 175 lbs. Which of the following is the best way to present the results: CIRCLE YOUR ANSWER.
      a. Our best estimate of the average weight of a gator taken in the hunt is 175 lbs. In addition, we are 25% confident that the true average weight of all the gators taken in the hunt falls between 80 lbs and 270 lbs.
      b. Our best estimate of the average weight of a gator taken in the hunt is 175 lbs. In addition, we are 5% confident that the true average weight of all the gators taken in the hunt falls between 150 lbs and 200 lbs.
      c. Our best estimate of the average weight of a gator taken in the hunt is 175 lbs. In addition, we are 95% confident that the true average we are 95% confident that the true average weight of all the gators taken in the hunt falls between 150 lbs and 200 lbs.
      d. Our best estimate of the average weight of a gator taken in the hunt is 175 lbs.

(Questions 2-5 available from the authors.)

Appendix C

Objectives for Merchandise Budget and Open-to-Buy (OTB)

What You Should Know About the Merchandise Budget and OTB

Objective:

1. You will be able to explain the concept and use of the Retail Merchandise Budget and OTB to answer questions such as "How much inventory will we sell and when will we sell it?" and "How much inventory should we buy and when should we buy it?"

How I will evaluate you:

You will be required to write your explanation.

Objective:

2. You will be able to perform all basic computations to construct a simple Merchandise Budget and OTB.

How I will evaluate you:

Given the input data, you will be required to perform selected computations to complete a Merchandise Budget and OTB on a regular course examination.

Objective:

3. You will be able to diagnose a retail business problem and recognize that implementation of a Merchandise Budget and OTB system is the appropriate solution.

How I will evaluate you:

You will be presented with several business problems/opportunity scenarios on an exam, one of which can be solved through the use of a Merchandise Budget and OTB system. You will be required to make the correct diagnosis and recommendation.

Appendix D

Independent Practice for Merchandise Budget and Open-to-Buy (OTB)

Use the data below to complete the Planned Merchandise Budget for the month of September in the fall season.

Data Table	
Initial markup percentage for September	45.0%
Maintained markup percentage for September	33.9%
September sales percentage	25.0%
Cost complement for September	55.0%
EOM stock for August	596,250
Total fall planned sales	795,000
BOM stock-to-sales ratio for September	3.0
BOM stock for October	477,000
Retail reduction percentage for September	5.0%

Merchandise Budget (September)	
BOM stock	
Sales	
Retail reductions	
EOM stock	
Purchases at retail	
Purchases at cost	
Initial markup	
Buyer's gross margin	
Stock on order (at retail)	20,000
OTB	

Appendix E

Objectives for Final Price Determination

What You Should Know About Arriving at the Final Price

Objective:

1. Be able to describe how to establish an initial approximate price level using four approaches: (a) demand-oriented, (b) cost-oriented, (c) profit-oriented, and (d) competition-oriented.

How I will evaluate you:

You will be asked to write a description of each pricing approach.

(continued)

Appendix E (continued)

Objective:
2. Be able to recognize major factors influencing the final list price from the approximate price level.

How I will evaluate you:
You will be asked to write a brief description of each of the three major factors that influence final price.

Objective:
3. Calculate an approximate price level using four approaches: (a) demand-oriented, (b) cost-oriented, (c) profit-oriented, and (d) competition-oriented.

How I will evaluate you:
You will be required calculate the approximate price level using each of the four pricing approaches.

Objective:
4. Be able to name and briefly describe each of four principal laws affecting pricing practices.

How I will evaluate you:
You will be asked to name and write a description of each of the four laws.

Appendix F

Independent Practice for Final Price Determination

Name: _____

Topic: "Final Price" Problems, Chapter 14

1. Describe the emphasis of each of the approaches when establishing an initial approximate price level:
   a. Demand-oriented approaches
   b. Cost-oriented approaches
   c. Profit-oriented approaches
   d. Competition-oriented approaches
2. Describe the three major factors that should be considered when setting the final list price from the approximate price level.
3. Flip X is a new type of flip flop entering the market this spring. The flip flop includes an MP3 player embedded in the sole that holds 100 songs and comes with a wireless headset.
   A specialty retailer has designed and manu-factured the flip flop to be sold in their beach shop stores across the nation. The costs for the flip flop to the retailer are $12.95 per pair. The company's research suggests that the absolute upper price limit for this new product is $110.00. A new competitor's product, which is similar, sells for $89.95.
   a. What price would the retailer charge using a skimming pricing strategy?
   b. What price would the retailer charge using a cost-plus pricing strategy adding $20 to the costs of all shoes?
   c. What price would the retailer charge using a target profit pricing strategy? (Assume fixed costs of $26,000, demand insensitivity up to $100, and a target profit of $15,000 at an annual volume of 1,000 pairs of flip flops.)
   d. What price would the retailer charge using an "at market" pricing strategy?
4. Name the four principal laws affecting pricing practices and briefly describe what each prohibits.

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1. Bloom's original 1956 Taxonomy was revised and updated by L. W. Anderson and Krathwohl (2001). Although there are some changes in the hierarchy, the basic concept is very similar, and the changes have not been widely adopted by those using Bloom's Taxonomy to structure learning outcomes.
2. Various users shift some steps and/or divide one step into two and ascribe to eight steps.
3. A description of the HDIM teaching approach for this class can be obtained from the authors.
4. A description of the HDIM teaching approach for this class can be obtained from the authors.

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