INSTRUCTIONAL DESIGN AND ASSESSMENT

Instructor Satisfaction With a Technology-based Resource for Diabetes Education

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Objectives. To evaluate instructor use patterns and satisfaction with *DM Educate*, a comprehensive, Web-based diabetes course.

Methods. Instructors completed a post-course survey instrument to assess their use of course materials and components, as well as satisfaction with the course content, design, and technology utilized, and to solicit their suggestions for additional content areas.

Results. Thirty-eight percent of respondents utilized *DM Educate* as a standalone elective and 62% had integrated materials into existing courses. The pharmacotherapy module was the most utilized at 91% and slide sets were the most utilized course components at 63%. All instructors stated that they would use the course again the following year. Suggestions for improvement included incorporation of more active-learning activities and patient cases.

Conclusion. Instructors' were highly satisfied with the course materials and technology used by *DM Educate*, a Web-based diabetes education course, and indicated they were able to customize the course materials both to establish new courses and supplement existing courses. All instructors planned to use the course again.

Keywords: diabetes, distance education, Internet, pharmacotherapy

INTRODUCTION

The Internet has opened new avenues for educating pharmacy students including through online courses, Internet-based mentoring programs, online active-learning exercises, and online recitation, as well as serving as a storage and retrieval site for supplemental course resources and course materials.¹⁻⁸ Student satisfaction and learning with Internet-based instructional resources have been well documented.³⁻¹¹

There is little published information on instructor satisfaction with Internet-based educational resources, and much of the available information consists of authors' discussion of a course that they developed and utilized only at their institution.^{4,5} There is, however, an opportunity to evaluate instructor usability and satisfaction in a course that was created to be shared by multiple instructors across different institutions and to use the results to validate course content and identify areas for further development.

DM Educate is a sharable Web-based course that gives instructors the tools needed to provide a comprehensive diabetes management education program. This course was developed to provide an interprofessional foundation in the principles of diabetes management. The faculty members who contributed to the project were educators and practitioners from pharmacy, nursing, medicine, behavioral psychology, dietetics, and exercise physiology. The course structure consists of video lectures, multiple-choice examination questions, and active-learning exercises delivered as 45 hours of content (equivalent to a 3-credit course) and divided by topic into 12 sections. Students are able to view a streaming video of the lecturer and the PowerPoint slide presentation in sync. All course components are housed on the *DM Educate* Web site, therefore printing and distribution of teaching materials or DVDs was not needed.

DM Educate may serve as a standalone elective course that students access outside of the classroom. Instructors may have minimal contact with students or choose to augment the course with active-learning exercises, patient case discussions, and/or general discussion. Instructors enroll their college/school of pharmacy by contacting the course administrator at <http://www.dmeducate.org>. When used as a standalone elective course, *DM Educate* should be

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approved by the college/school's curriculum committee and assigned a course number accordingly. Once enrolled, the instructor provides the course administrator a list of students who then each receive a log-on name and password for the course. Instructors have access only to those students enrolled in their course. Alternatively, *DM Educate* may be used to supplement existing course material. In addition to the video lectures, instructors are provided with slide sets and lecture notes, multiple-choice examination questions, active-learning exercises, and an internal grade book. An instructor may choose which components of *DM Educate* to incorporate into an existing course. For example, instructors may choose to play video lectures in class, present the lecture material themselves, or have students view only certain lectures online outside the classroom.

The development of this course with a detailed description of the course components has been described in the literature.¹² The course is available to colleges and schools of pharmacy at no charge, and as of June 2008, 81 colleges and schools of pharmacy had registered to evaluate and potentially use *DM Educate*. The study described herein focused on the 27 colleges and schools that used the course resources during the 2006-2007 academic year. Of these, 12 schools used the course as a stand-alone elective, while 15 schools integrated the course material into an existing curriculum. The purpose of this study was to determine how faculty members use *DM Educate* and how satisfied they are with the course, validate continued support for the course, and target areas for further development.

METHODS

This study focused on the 27 colleges and schools that used *DM Educate* resources during the 2006-2007 academic year. An e-mail was sent to the instructors at these colleges and schools asking them to participate in a post-course survey to assess their use of and satisfaction with the *DM Educate* course structure and materials. The e-mail explained the purpose of the research, included a link to the electronic survey instrument (Survey Monkey; Portland, Oregon) and requested their written consent to participate in the study.

The survey instrument asked respondents to indicate whether they used *DM Educate* as a standalone elective or integrated material into an existing course(s). If *DM Educate* course materials were integrated into existing courses, instructors were asked which of the 12 modules they used, as well as which components (PowerPoint slides, video lectures, learning activities, and/or multiple choice questions) they selected.

Respondents also were asked to respond with "agree," "disagree," or "neither agree nor disagree" to assess (1)

the extent to which the course materials improved their ability to educate students on diabetes, overall and in specific focus areas; (2) the organization of the course material; and (3) technical aspects. The survey instrument also solicited additional information via open-ended items, and asked instructors whether they intended to use the course in the future, and, if so, in what way

Participants' responses were deidentified. Institutional Review Board approval was obtained at the University of Pittsburgh prior to contacting the instructors.

RESULTS

Instructors at 27 colleges and schools used *DM Educate* during the 2006-2007 academic year; of these, 16 (59%) consented to participate in the study and completed the post-course survey instrument. The course was utilized across all 4 professional years (P1-P4), with 12% of the programs using the resources in the P1 year, 38% in the P2 year, 56% in the P3 year, and 38% in the P4 year. Four colleges and schools utilized the course across multiple years. Eight hundred forty-two students from the 16 colleges and schools of pharmacy were enrolled in *DM Educate*, with an average class size of 15-30 students (range 4-356). Four of the colleges and schools reported having a standalone diabetes elective course offered at least once during the previous 5 years.

Thirty-eight percent (n = 6) of respondents used *DM Educate* as a standalone course, with 66% (n = 4) of these adding supplemental activities such as group discussions, patient cases, and onsite clinical visits. The remaining 62% (n = 10) of respondents integrated *DM Educate* materials into an existing course. The specific modules

Table 1. Proportion of Schools Incorporating Specific *DM Educate* Modules into Existing Courses (n = 10)

Module	Schools Using Module, %
Definition and Pathophysiology	63
Comprehensive Approach to Management	72
Pharmacotherapy	91
Medical Nutrition Therapy	73
Exercise Therapy	36
Monitoring Diabetes	73
Complications	64
Special Populations	46
Psychological Issues	36
Education	64
Pharmacist Role	46
Living with Diabetes	9

Table 2. Components of *DM Educate* Integrated into Existing Courses (n=10)

Component	Schools Using This Component, %
Slides	63
Video presentation	55
Learning activities	45
Exam questions	27

and components integrated are shown in Tables 1 and 2, respectively.

Results of the post-course instructor satisfaction survey are shown in Tables 3 and 4. All of the respondents indicated that they would use *DM Educate* again, with 37% (n = 6) indicating that they would make changes to the way they used the course for the following year. Requests for additional resources included information on new medications and devices for the treatment of diabetes and related complications (n = 4), updated information to reflect new recommendations of the American Diabetes Association (n = 2), more focus on insulin dosing (n = 2), case-based examination questions (n = 1), information on investigational medications (n = 1), and practice cases (n = 1).

DISCUSSION

Survey responses from the instructors participating in this study confirmed the flexibility that was intentionally designed into *DM Educate*, with about one-third of instructors using it as a standalone elective and two-thirds incorporating 1 or more modules into existing courses. The program's flexibility was also reflected in the instructors using the course or its components in each year of the professional curriculum and 4 schools using it across

multiple years. Almost all instructors reported that they felt the course challenged their students and increased their students' interest in obtaining more training in caring for patients with diabetes. The instructors were highly satisfied with their experience and all indicated they would use the course again.

Among the 10 schools that integrated modules from *DM Educate* into their existing curriculum, the most commonly used component was the module on pharmacotherapy. The investigators anticipated that other modules, such as psychological issues or special populations, might be utilized to a higher extent as many colleges and schools of pharmacy do not have experts in these areas on their faculty. However, fewer than half of the schools integrating modules into existing courses utilized these modules in their courses. Of the colleges and schools that used the psychology module, only 60% thought that the course improved their ability to educate students about the topic. This may reflect the content of existing courses on diabetes, which focuses on pharmacotherapy rather than on a comprehensive diabetes management approach. This focus on pharmacotherapy may be due to several factors, including curricular time allotment for material and instructor comfort level with material. In addition, as this was the first year that instructors used *DM Educate*, some instructors may have been simply testing different components and not utilizing the course to its full potential. Thirty-seven (37%) stated that they would make adjustments the following year in how they used course materials.

Another area of use that was not anticipated by the *DM Educate* design team was with fourth-year students while at advanced pharmacy practice experience (APPE) sites.¹² The course was developed as a 3-credit course with 45 hours of lecture content under the assumption that

Table 3. Instructor Satisfaction With *DM Educate* Course Content (n=16)

Survey Question	Disagree, %	Neither Agree nor Disagree, %	Agree, %	No. of Respondents
I think the information provided in this course improved my ability to educate students about:				
All areas of diabetes management	0	10	90	10
Use and monitoring of diabetes-related medications	0	0	100	3
Nutrition and meal planning	0	20	80	5
Recognition and treatment of complications	0	33	67	3
Psychosocial considerations	0	40	60	5
I think the information provided by <i>DM Educate</i> :				
Challenged my students intellectually	0	10	90	10
Was well organized without unnecessary duplication between modules	10	20	70	10
Has increased the interest of students to seek out further diabetes education	0	30	70	10

Table 4. Instructor Satisfaction With *DM Educate* Technology (n=16)

Survey Question	Disagree	Neither Agree nor Disagree, %	Agree
Technical difficulties impeded my students' learning.	63	25	13
Technical difficulties impeded my ability to instruct the students	69	31	0
The help desk responded in a timely manner to technical difficulties	13	50	37

the course would be used during the didactic years. However, 6 of the instructors used the video lecture component of the course to supplement therapeutic discussions. Unfortunately, due to the structure of the survey instrument, we were unable to determine which modules were utilized by these students. This finding opens a new area for an evaluation of how instructors are using *DM Educate* to enhance experiential learning. Further investigation will provide information on how an instructor can adapt the course to meet the needs of the practice site, as well as assess how the course may be utilized to meet the needs of individual students. In addition, this assessment will target areas of development for *DM Educate* and create usage recommendations for the course specific to meeting experiential learning needs.

Several instructors offered suggestions for improving the program. Six instructors suggested providing access to the test question data bank and the test scores of students on the formative quizzes through the *DM Educate* Web site to allow real-time access. The test questions and resulting student scores were available by providing a request via e-mail to the course administrator. Thus, if instructors wanted to monitor their students' progress regularly, this could become a cumbersome process. The next version of *DM Educate* will accommodate improved course management tools for instructors that not only allow them to access test questions but also to contribute new test questions to the data bank through a peer-review process. Instructors also indicated that they wanted updates whenever new information or new drugs became available. Since this study was conducted, updates have been made to the pharmacotherapy module regarding newly approved oral agents, insulin use and insulin delivery devices.

DM Educate was a success for the instructors at the 16 colleges and schools of pharmacy participating in this study. An updated version of *DM Educate* will include an instructor learning community that will allow instructors to share best practices, teaching cases, and active-learning exercises. The ability to share best practices among the 81 schools of pharmacy registered to use *DM Educate* has the potential to significantly enhance how instructors prepare pharmacy students for the challenges

of helping patients manage diabetes. The acceptance of the course by a large number of schools and the high level of instructor satisfaction show that *DM Educate* can serve as a model for sharing content and courses among colleges and schools of pharmacy.

CONCLUSION

Evaluation of instructor usage of *DM Educate* supports the flexibility of the course with customization of the course materials to the instructors needs. The high level of satisfaction supports continued use of the course. Suggestions from instructors and the discovery of the use of the course with advanced practice experiential learning students will drive future growth and development of *DM Educate*.

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