



Project 3

Original Research – Self-regulation in Online Learning

Context

This presentation was created in Fall 2001 while I was employed by Option Six, Inc., an e-learning content developer in Bloomington, Indiana. This presentation was developed for presentation at Webnet 2001 in Orlando, Florida.

Conditions

The presentation was created by myself and two other employees of Option Six, Inc. Our purpose for this presentation was to share an effective online pedagogical model we had a part in creating and used extensively over the past year. The presentation was also intended to develop interest in Option Six courses with potential clients.

Scope

This presentation was created specifically for delivery at Webnet 2001 in Orlando, Florida. Continuing research is planned for Summer and Fall 2002.

Role

I provided the overall research project direction. As first author, I wrote the first draft of the presentation. I delivered the entire presentation at Webnet 2001.

Included Excerpt

In this portfolio, I have included the presentation proceedings paper and the presentation slides.

Embedded self-assessments in Executive Education courses: Improving participant learning and perceptions of course quality

Background: We have been building online Executive Education courses for Cardean University as employees of UNext. At UNext, these courses are referred to as “Quantum” courses, to distinguish them from traditional academic courses in Cardean’s online MBA program. Quantum courses provide a six to ten hour learning experience that provides information about a relevant business topic (e.g. change management, brand management, and financial statements) as well as an opportunity for learners to apply what they are learning in a relevant task. Quantum courses use many interactive techniques and “widgets” to engage and motivate students. Widgets are javascript-based XML objects that course development teams use to build common interactive instructional segments. One class of widget is the self-assessment. Self-assessments are used in some courses to provide a quick way for learners to ascertain whether they are learning anything or not. How effective are these self-assessment techniques? To date, no research (that we are aware of) has attempted to evaluate the effectiveness of any of these instructional devices in online executive education. We have been relying primarily on “good design principles” and preliminary user experience testing to guide our designs and implementations. While we do not consider this reliance on principle invalid, we have undertaken a research project designed to establish the effectiveness of embedded self-assessments.

Researching the effectiveness of using embedded self-assessments on student learning and perceptions of learning is beneficial to UNext in several aspects. First, it will help to determine if these assessments are indeed helping the students to learn and retain the content of a course. Second, as developing quantum courses is a resource intensive process, learning whether embedded self-assessments are useful to students would help in not only improving the courses, but also streamlining production to focus on course design that effectively helps students learn. Additionally, learning about how the student perceives the self-assessments is also beneficial. Even if there is no difference in learning (measured by post-assessment) between students who take courses that have self-assessments and course that do not have self-assessments, if the student perceives that they are learning more, this may be valuable in itself. Even the perception of increased learning may lead to greater learner satisfaction. In the business of e-learning, satisfied learners generally leads to satisfied customers.

Study questions: In order to learn more about the use of self-assessment questions in Quantum courses, this study answers two major questions.

1. Do embedded self-assessments affect student attitudes or perceptions about learning in a Quantum course, as measured by a survey administered after course completion?
2. Do embedded self-assessments affect student learning in a Quantum course, as measured by a multiple choice post-assessment?

Participants: Thirty participants who fit the target profile for Quantum course students will complete the study. Participants should be degreed business professionals, interested in the course topic, and familiar with using the Internet (browsing the world wide web, using email, etc.) but should not be familiar with the specific course content. Participants are asked to volunteer three to four hours of their time (in one sitting) for the study. Participants are offered small compensation for their participation, in the form of light refreshments and gift certificates to local restaurants. It is not expected that this compensation will affect the results of the study.

Context: Participants complete two courses from one Quantum course suite, “Get the Net.” This Quantum suite is designed to help professionals understand, recognize, and analyze working Internet business models using information gathered on the Internet. It explains key economic principles that underlie the Internet's rapid transformation of business strategy and culture. The research team observes participants as they complete the study under one of two conditions. One condition is “Quantum course without embedded self-assessments.” The other condition is “Quantum course with embedded self-assessments.” Participants in both conditions are given a final attitude survey and a comprehensive (approximately twenty question) post-assessment. Quantitative analysis of the survey responses and post-assessment results, and qualitative analysis of participant debriefing transcripts is used to generate findings and recommendations.

Method: The courses chosen for the study are the first two courses in the “Get the Net” Quantum suite. The course titles are “Evolution of the Firm” and “Age of Human Capital.” These courses were chosen because of an expected high level of participant interest in the topic, content that is new to the participants, and the minimal existing use of self-assessments in each course.

The research team created a set of embedded self-assessments for four of the five sections in each course. The fifth course section already includes an assessment component, and self-assessments do not “fit” the instructional purpose of the section. The team also removed the minimal amount of embedded self-assessments that existed already in the courses, taking care not to change course content or activities which demonstrate content mastery.

Participants complete the study during a single three to four hour time block in the User Experience Lab at UNext’s Bloomington Development Center in Bloomington, Indiana. This lab is equipped with multiple testing stations, at which the participants will complete the study and access the online courses. Participants are briefed on the use of the testing station computers, how to access the course, and the overall topic of the study, but will not be informed of the particular study group they are in. Participants are instructed to complete each of the courses thoroughly and that their learning will be assessed after they complete the courses. One study group completes the courses without the self-assessments and the other group completes the courses with the embedded self-assessment condition applied.

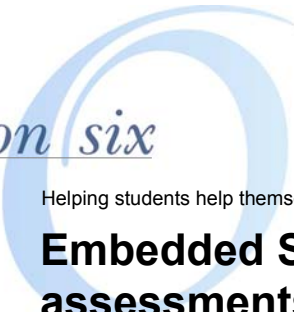
All participants complete one attitude survey and one comprehensive post-assessment after completing both courses. The attitudinal survey asks the participants questions about how they feel in regards to the assessment techniques used in the course; whether or not they found them useful. They are also asked questions concerning their thoughts on the course content itself and their perceived mastery of it. The survey uses a Lickert scale for participant responses. The post-assessment serves to assess the participants’ mastery of the course content for comparison between the two study groups. This assessment uses a mix of multiple choice and short essay questions.

Analysis: A comparison will be made between the survey responses between the groups of participants in each condition. Specifically, we will look for evidence of correlation between the existence of embedded self-assessments and student perception of learning and attitude toward the overall course experience. Additionally, we will look for evidence of correlation between the existence of embedded self-assessments and student achievement on the post-assessment. The post-assessments will also be analyzed to determine if one group performed better or worse than the other. A rating scale will be used to rate the essay responses and three raters will be used, the average of their ratings being calculated to determine scores.

Expected findings: We expect that the existence of embedded self-assessments will increase the student’s perception of learning, and will also increase the student’s learning of course content. If this expectation is upheld by the study data, this may lead to a recommendation that more embedded self-assessments be included in Quantum course suite designs. If the study finds that self-assessments do not positively influence student perception of learning or actual student learning as measured by the attitude survey and post-assessment, respectively, a recommendation will be made to reconsider the current use of self-assessments. This may lead to removal of self-assessments or the re-design of self-assessments in order to increase their effectiveness.

At the time of this proposal submission, the study design has been finalized and we are beginning to gather data. At the time of the Webnet 2001 conference, all data will be gathered, analysis will be complete, and preliminary findings will be reported.

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Helping students help themselves

Embedded Self-assessments in E-learning

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October 26, 2001 Webnet 2001, Orlando, FL

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Self-regulated Learning

- Defined: active, goal directed, self-control of behavior, motivation, and cognition for academic tasks by an individual student (Pintrich, 1995)
- Self-regulated students are better (e-)learners (Knowles, 1990; Pintrich, 1995).
- Students “arrive” with varying levels of self-regulation (Zimmerman & Paulsen, 1995).
- Students can learn to self-regulate (Zimmerman & Schunk, 1989).
- Self-evaluation is important when it is frequent or conveys information the student may not acquire on their own (Schunk, 1996).
- Learning goals with self-evaluation leads to increased persistence; performance goals with self-evaluation leads to higher self efficacy, self-regulation, skill and task orientation (Schunk, 1994).

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We think ...

- Self-assessments can be used effectively in e-learning contexts to help students regulate their learning and become more effective learners.
- Especially in self-paced independent e-learning applications, students **should be** assisted in regulating their learning through the use of self-assessment strategies.
- Self-assessments should be “embedded” into the instructional content.
- Opportunities for self-assessment should be frequent – after each 10-15 minutes of “learning time.”
- The style of the self-assessment should fit the learning context – content, student, system.

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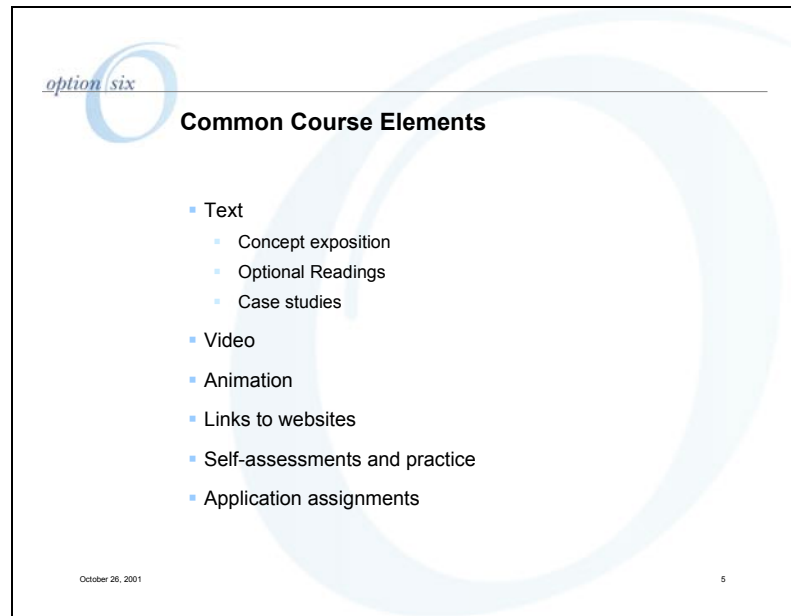
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Online Course Styles

- MBA program courses (for academic credit)
 - 30 student hours, suites of 3-4 courses, instructor-facilitated PBL
 - Sample of subjects: Data Mining, Building a Visionary Company, Global Business Strategy, PreMBA Prep, Financial Investments
- Executive and Management training
 - 1-2 hours, suites of 4-5 courses, instructor option, cognitive apprenticeship approach
 - Sample of subjects: IT Strategy basics, Change Management, Accounting (several), Project Management, Marketing (several), more ...
- Company-wide training (Staff and Line levels)
 - 1-3 hours, suites (4-5 courses) and series (10-30 courses), instructor option, varied pedagogical approaches (PCL)
 - Sample of subjects: Post-purchase Marketing, Enabling Innovation, Parliamentary Procedure, Concepts in Finance, Accounting, Marketing, Project Management

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Common Course Elements

- Text
 - Concept exposition
 - Optional Readings
 - Case studies
- Video
- Animation
- Links to websites
- Self-assessments and practice
- Application assignments

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Self-assessments

- Practice
- Evaluation
- Feedback
- Progress report

- Samples

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Learning Resource “Key Questions”

Key Questions for Why Data Mining?

1. How does data mining handle complex information?
[Answer](#)
2. What is meant by variable exclusion, and how does it relate to data mining?
[Answer](#)

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Optional Feedback

Key Questions for Why Data Mining?

1. How does data mining handle complex information?
[Answer](#)
2. What is meant by variable exclusion, and how does it relate to data mining?
[Answer](#)

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Why Data Mining Solution 1 - Microsoft Internet Explorer

Solution

print

1. How does data mining handle complex information?

Data mining can ensure that complex relationships among the variables in a data set are accurately captured. In addition, data mining allows analysts to efficiently sift through the data and find useful information.

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option six **“Check your Understanding”**

Instructions Compare Reset

In the mid-1970s, Hewlett-Packard and Atari, giants in the electronics industry, both were offered and declined the opportunity to purchase Apple's early personal computer.

"Hey, we've got this amazing thing, even built with some of your parts, and what do you think about funding us? Or we'll give it to you. We just want to do it. Pay our salary, we'll come work for you," said Steve Jobs, co-founder of Apple, talking about Apple's early efforts to sell the personal computer to Atari.

Both companies eventually entered the market with their own personal computers, but Apple captured the market first.

Explain in three sentences or less why you think these two companies passed up this innovative opportunity.

Type your response here.

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option six **Compare to “Expert”**

Instructions Compare Reset

This is my answer. I'd like to see how it compares with an expert answer.

Hewlett-Packard and Atari were large companies with established positions in the electronics industry. This could have provided the financial foundation from which an innovative idea could be launched. With that in mind, it may have appeared less advantageous to them to support an innovative idea that their current customers had expressed little interest in. In addition, the niche market for personal electronics, at this point consisting of games and desktop calculators, may not have appeared ready for a personal computer that had no usable applications. Of course, this missed opportunity ultimately cost both companies. Today, after trying to compete in the personal computer market, Atari is no longer a player, and HP has taken a number of years to catch up.

Your Response Expert Response

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option six **“Self Assessment”**

Self-assessment

Answer the question below in the space provided. When finished, click "Submit." Then compare your answer to the expert answer provided.

From DYI's marketing research report, it appears that the company has problems with customer satisfaction. How might DYI employ the three key strategies for an effective customer service plan to improve customer satisfaction? For each strategy, list the strategy and explain in two to three sentences how DYI might implement it.

Your answer:

I

Submit >>>

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option six **Compare your answer.**

Self-assessment **Submit >>>**

Answer the question below in the space provided. When finished, click "Submit." Then compare your answer to the expert answer provided.

From DYI's marketing research report, it appears that the company has problems with customer satisfaction. How might DYI employ the three key strategies for an effective customer service plan to improve customer satisfaction? For each strategy, list the strategy and explain in two to three sentences how DYI might implement it.

Your answer:

I

Submit >>>

Compare your answer.

DYI will want to be sure to employ three key strategies when building an effective customer service department.

First, staffing is key. DYI will want to hire good people, and it will want enough people on hand to help minimize wait times for customers. To get and keep good customer service talent, DYI will need to treat members of the department well and compensate them for good work. Employee dissatisfaction in the customer service area will often be transferred to the customer in the form of frustrations or poor customer service.


Training of the customer service staff is essential for any business, especially software companies. The staff needs to understand the software and how to use it. They do not need to be experts, but they need to know where to find answers and know the most commonly asked questions. Since the software will most likely be updated regularly, the staff will need to be trained on the new improvements and additions to the product.

Technology can be a key advantage for DYI. First, the company needs to ensure that staff members have access to the information they need to best serve the customer. This can include customer records, including purchase history and customer call center history. Technology can also provide the staff with instant access to a database of information that helps them solve problems for the customer.

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option six **Multiple Choice**

Financial Accounting: Reliability of Financial Accounting 

Question 1
Which of the following statements is accurate regarding GAAP?

- a. Following GAAP is an acceptable method by which to calculate a firm's indebtedness to the government for federal income taxes.
- b. GAAP has been developed by government agencies such as the Securities and Exchange Commission (SEC) to ensure consistency in reporting among publicly held companies.
- c. GAAP has been developed by the auditing profession to regulate its auditing standards.
- d. GAAP is a set of accounting principles set up by the profession itself and administered by an independent body composed of accounting and investing professionals.
- e. skip this question

Question 2
Which of the following best describes the SEC?


- a. A U.S. government organization that oversees and regulates the financial reporting of companies and securities traded in public markets
- b. An independent organization responsible for establishing the standards for financial accounting and reporting in the United States
- c. A U.S. government organization that oversees and regulates financial reporting for private companies and companies with securities traded in public markets
- d. An independent organization responsible for ensuring the reliability of financial accounting information
- e. skip this question

Submit Answers

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option six **Immediate Feedback**

Financial Accounting: Reliability of Financial Accounting 

Question 1
Which of the following statements is accurate regarding GAAP?

- a. Following GAAP is an acceptable method by which to calculate a firm's indebtedness to the government for federal income taxes.
- b. GAAP has been developed by government agencies such as the Securities and Exchange Commission (SEC) to ensure consistency in reporting among publicly held companies.
- c. GAAP has been developed by the auditing profession to regulate its auditing standards.
- d. GAAP is a set of accounting principles set up by the profession itself and administered by an independent body composed of accounting and investing professionals.
- e. skip this question

Correct.


Question 2
Which of the following best describes the SEC?

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- b. An independent organization responsible for establishing the standards for financial accounting and reporting in the United States
- c. A U.S. government organization that oversees and regulates financial reporting for private companies and companies with securities traded in public markets
- d. An independent organization responsible for ensuring the reliability of financial accounting information
- e. skip this question

Incorrect. The correct answer is a.

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Study Questions

- Do students perceive self-assessments in an online course as an aid to their learning?
- Does the use of embedded self-assessments improve student learning?
- What types of self-assessments do students prefer?

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Design of the Study

- Two related one-hour courses, two versions of each
 - One of each with SAs, one of each without SAs
- Thirty student participants from target population
- Pre-test/post-test for cognitive level (what do they know?)
- Each student takes both courses, one with SAs, one without SAs
- Half of each group begins with the SA version of a course, the other half begins with the non-SA course.
- Post course evaluation (questionnaire) of perceptions about learning.
- Debrief interview (brief).

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Analysis

- Quantitative analyses
 - Is there a difference in student learning and/or student perception of learning correlated to
 - course version (SA or non-SA)?
 - order of the course versions (SA→non-SA or non-SA→SA)?
 - Does student perception of learning and actual (cognitive) learning correlate?
- Qualitative analyses
 - Did you notice a difference between courses?
 - What did you think of the SAs?
 - Did the SAs help you learn?
 - What style of SAs do you prefer?

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Pilot study – October 2001

- Purpose: Will the subjects perceive an effect on their learning due to self-assessments?
- Ten subjects
- One course:
 - Four, 15-minute course sections
 - Two versions of each section
- Five students started with SA version, five started with non-SA version
 - Alternating versions for subsequent sections
- Questionnaire - perception of learning
- Debrief interview

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Questionnaire – Perceptions about learning

1) How well do you think you learned the concept?
Not at all 1 2 3 4 5 6 7 Very Well

2) How confident are you that you could apply the concept presented?
Not confident 1 2 3 4 5 6 7 Very Confident

3) How well could you explain the concept in this section after completing the materials?
Not at all 1 2 3 4 5 6 7 Very Well

4) What was your perception of the learning experience?
Negative 1 2 3 4 5 6 7 Positive

5) To what degree has taking this course increased your understanding of the topic:
Not at all 1 2 3 4 5 6 7 A great deal

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Pilot Findings

- Quantitative analysis
 - no significant difference ($p=.63$) between conditions
- Qualitative analysis
 - Most subjects valued self-assessments as an aid in their learning. [Sample.](#)
 - Subjects may not notice self-assessments.
 - Subjects prefer optional self-assessments.
 - Different subjects prefer different types of self-assessment. [Sample.](#)
- Changes for next time
 - larger N
 - better focus for questionnaire items
 - motivating learning – creating the “desire to learn”

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Self-assessment helpful?

- "I like them, They provide good immediate feedback. They break things up, so I'm not just reading while my mind wanders ... 'Was I reading? What was I reading?' They helped keep me focused."
- [The course was] Better with them. They tested what I knew. Doing it a little reinforces the learning. [They] It provided something for me to do on my own - applying concepts.
- They were helpful to reinforce the concepts.
- I didn't like the self-assessments.

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Self-assessment style

- They [write out your answer type] helped me learn more because I had to explain what I was learning to someone, and that reinforces my learning. I wouldn't have liked those [multiple-choice style] as much because it would have been too much like school.
- I like the expert response to check myself. Multiple choice is stupid, you don't have to think of your own responses.
- Short answer makes me nervous.
- I don't like "expert answers." I would have thought multiple choice answers would have been better with immediate "right or wrong" feedback.
- I noticed I didn't have to type the answer in, I could just look at the right answer.

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Next Steps

- Full study Nov/Dec 2001
- Findings submitted for publication - March 2002
- Preliminary results will be available Jan/Feb 2002 at:

<http://www.option-six.com>

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Questions?

- Contact:

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<http://www.option-six.com>

Presentation slides/paper:
http://php.indiana.edu/~bjbeatty/present/webnet_2001.htm

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