An Active, Reflective Learning Cycle
for E-Commerce Classes:
Learning about E-commerce
by Doing and Teaching*

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ABSTRACT

Active, experiential learning is an important component in information systems education, ensuring that students gain an appreciation for both practical and theoretical information systems concepts. Typically, students in active, experiential classes engage in real world projects for commercial companies or not-for-profit organizations. In the latter case, such engagements are often referred to as 'service learning' or 'community-engaged education'. In this paper, we describe a novel capstone information systems class where, instead of undertaking a conventional single-team, single-project experiential engagement, the students initiated a fully-fledged new not-for-profit organization from the ground up. The not-for-profit organization, The Online Business Guidebook, was founded with the mission of providing public education on how to start and grow an online business. In an unusual twist on a typical e-commerce class, the students both implemented e-commerce technologies ("active learning by *doing*") and created and disseminated e-commerce training materials ("reflective learning / learning by *teaching*"), rather than solely being recipients of instructional resources. This paper describes the manner in which this class was run, the learning outcomes set and evaluation methods used, problems encountered, and recommendations. We propose a replicable model and specific learning outcomes for information systems educators who wish to teach e-commerce classes with an active and reflective pedagogical approach.

Keywords: E-commerce, Entrepreneurship, IS Curriculum Design, Web Start-ups

1. INTRODUCTION

With the increasing popularity of e-commerce courses (Gunasekaran, Ngai, and Harris, 2005; Moshkovich, Mechitov, and Olson, 2006), information systems educators have been challenged to find course delivery mechanisms that are successful in providing a solid theoretical and practical e-business foundation to students (Changchit, Cutshall, and Gonsalves, 2006). A popular mechanism for teaching information students about the commercial applications of the web has been to engage students in active, experiential projects with real industrial clients or not-for-profit institutions. Typically, students are organized into teams, and each team undertakes a single system development project for the external client. In this paper, we discuss a somewhat different course formulation, where the students were organized into functional teams, and the class together built a real, standalone, not-for-profit organization. The organization, named The Online Business Guidebook, produces a free step-by-step tutorial guide on how to start and grow an online business (Singh, 2009; Lovett, 2010). It is hoped that this guide, produced "by students for students", will be useful in providing a comprehensive and up-to-date e-commerce curriculum, and will be widely adopted by information systems educators.

In the remainder of this paper, we describe how the Online Business Guidebook organization was created by successive classes of information systems students, and the les-

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sons learned. We begin with a discussion of related work on experiential learning, e-commerce, and entrepreneurship in the information systems classroom. We then describe the structure of our course, learning objectives set, and evaluations. We adapt a conventional experiential learning model from another education discipline, and propose a replicable experiential learning model specifically for the information systems classroom. Finally, we suggest some future work.

2. RELATED WORK

The information systems education literature is replete with examples of practical experiential learning, service learning, e-commerce education, and teaching entrepreneurship to information systems students.

Active, experiential learning, where students work on projects for real clients, has long been popular in information systems classes (Song, 1996; de Brock, 2001; Gabbert and Treu, 2001; Fox, 2002; Tan and Phillips, 2003; Scott, 2006; Klappholz, 2008; Tan and Jones, 2008), particularly in general systems analysis, design, and development classes (Chen, 2006; Mitra and Bullinger, 2007; Martincic, 2009; Tadayon, 2004) and capstone MIS classes (Janicki, Fischetti, and Burns, 2007; McGann and Cahill, 2005). In some cases, experiential learning is elevated to such importance that university support centers outside the individual classroom are provided, to facilitate interaction of students with live clients across multiple semesters (Chase, Oakes, and Ramsey, 2007). Kolb (1984, p.21), provides an illustration of a seminal experiential learning model – see Figure 1. In this model, students obtain real, concrete experience, observe and reflect on their experience, generalize what they learned, and actively experiment in new situations.
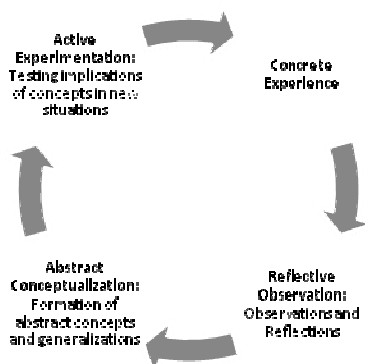

Figure 1: Experiential Learning Model, from Kolb (1984)

In Anderson and Kratwohl's (2001) adaptation of Benjamin Bloom's Taxonomy of levels of learning attainment, student's learning achievement is gauged from basic learning (Remembering) to more advanced levels of learning (Understanding, Applying, Analyzing, Evaluating, and, finally, Creating). This is illustrated in Figure 2 below. The approach we describe in this paper is tailored to helping information technology students to proceed upwards through all of Bloom's learning levels.

Service learning is also popular in undergraduate information systems courses. In service learning projects, the client organization is a community-based not-for-profit organization, rather than a for-profit corporation. Examples of service learning projects in information systems curricula are abundant: see (Wei, Siow, and Burley, 2007; Hoxmeier and Lenk, 2003; Lenox, 2008; Saulnier, 2005; Scott, 2006; Tan and Phillips, 2005).
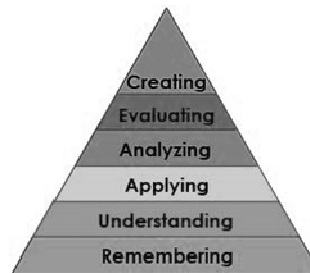
Source: Richard C. Overbaugh, Lynn Schultz, Old Dominion University, http://www.odu.edu/educ/roverbau/Bloom/blooms_taxonomy.htm
Figure 2: (Anderson and Krathwohl's Adaptation of) Bloom's Taxonomy of Learning Attainment Levels

E-commerce courses are a commonly-seen component of undergraduate information systems programs (Lim, 2002; Moshkovich, Mechitov, and Olson, 2006; Gunasekaran, Ngai, and Harris, 2005). Various different e-commerce teaching pedagogies have been described in the literature. For example, De Villiers and Abrahams (2000) provide a basic e-commerce application development method, Kovacs (2005) suggests a project-based model, and Greer (2002) reviews critical success factors for electronic commerce courses. Changchit, Cutshall, and Gonsalves (2006) stress the need for a strong practical component in e-commerce courses. Braender, Kapp, and Yeras (2009) describe an e-commerce class that provides students with practical experience working with actual web-based tools, such as content management and web analytics platforms. Williams and Chinn (2009) foster active learning by having students use Web 2.0 technologies in a real world scenario: promotion of a sporting event. In Tabor (2005), e-commerce students are tasked with small business consulting projects that involve real application of e-commerce technologies to live companies. Other e-commerce classes explicitly promote community-engaged service-learning (Preiser-Houy and Navarette, 2007).

General entrepreneurship classes are widely taught at business schools – see Gartner and Vesper (1994) for a thorough enumeration of general entrepreneurship classes and lessons learned. Many entrepreneurship classes incorporate a strong information systems component. For example, Kor and Abrahams (2007) detail the creation of a for-profit venture by senior information systems students, and Terwiesch and Ulrich (2009) describe the creation of new e-commerce ventures by information systems students using 'innovation tournaments' to quickly generate and assess competing concepts and designs. Neck and Stoddard (2006) describe an acclaimed freshmen information systems class at Babson College where students engage in the creation of new ventures, with each semester's proceeds being donated to charity. Importantly, Lucas et al. (2009), in studies of British entrepreneurship education programs, found that authentic experience must be incorporated in the education program if

the program is to have an enduring effect on entrepreneurial intent.

The course format described in this paper differs in a number of respects from earlier descriptions of teaching on experiential learning, e-commerce, and entrepreneurship. Unlike conventional experiential learning projects, students did not engage with an extant client, but rather created a new web-based not-for-profit venture, the Online Business Guidebook. The single-team, single-project engagement model was supplanted with an approach where information systems students organized into multiple functional teams, tackling not just system development tasks, but also business development tasks such as physical product design and production, promotion, sales, and distribution. It was hoped that this format would provide information systems students with a broad appreciation for the different functional areas of an active business. The Online Business Guidebook venture further differed from earlier e-commerce and entrepreneurship classes in that students did not solely rely on instructor-provided educational resources: rather, the students engaged in the development and dissemination of e-commerce instructional materials themselves, effectively teaching while learning. The learning process applied in the class reported in this paper is reminiscent of Kolb's Experiential Learning Model – see Figure 1, again. In this class, each student engaged in *concrete experience and active experimentation*: identifying, assessing, implementing, and refining a particular technology required by the new organization – for example, choosing and implementing an email marketing package, and creating and tracking multiple email marketing campaigns. During *reflective observation and abstract conceptualization*. the student reflected on their experiences and documented the process they followed to implement the technology, including important features they found and issues they encountered – for example, they created descriptive spreads explaining what they had learned, through their experiences, about the field of email marketing, and they shared these new learning resources with each other.

3. COURSE STRUCTURE

The objective of this course was to have students participate in the creation of a new, web-based, not-for-profit business, whose mission would be to provide public education on starting and growing an online business. In this section, we look at the semesters, functional teams, and schedule employed.

3.1 Semesters
The course ran over multiple semesters. The idea of the guidebook was conceived during the first semester of the course (Fall 2008) by the instructor. During the first semester, the students mostly focused on defining the business, reviewing alternative books and magazines with a similar target audience, choosing a name for the organization, designing a logo, completing administrative registration steps (statutory filing forms), drafting samples of the publication and website, and preparing detailed plans for the next semester. As the Fall 2008 class comprised only 9 students, it was not possible to build a full production-grade guidebook. Each student was assigned to research and write about 2 topics,

and a small sample publication was produced, though not for public release.

During the second semester (Spring 2009), 40 students participated in the organization (32 for credit, plus 8 volunteers). One student from the first semester, who had previously served as Marketing Director, remained with the organization after graduating, serving as part-time CEO. The CEO visited the follow-on class every 2 weeks to assist with knowledge transfer and task allocation. During Spring 2009, each student was assigned to research a single topic. The best quality topics were selected, and compiled into a production-grade guidebook, which was titled "The Online Business Guidebook – Fall 2009", and released to the public in both hardcopy and e-book formats (Singh, 2009).

In the third semester (Fall 2009) of the course, each of the 12 students was assigned to research 4 topics (total 48 topics), including some topics from the previous guidebook edition (36 total old topics), and some new topics (12 total new topics), that were not previously covered. The best submissions were compiled into an updated and extended guidebook: "The Online Business Guidebook – Spring 2010" (Lovett, 2010).

Finally, in the course's fourth semester (Spring 2010), students revised content of the hardcopy edition; launched and populated wikis, blogs, and discussion forums about e-commerce; created and tracked new e-mail, direct mail, and physical outreach campaigns; and managed inbound orders and outbound shipments. In response to feedback from readers and outreach participants, who requested a fully-worked, fully-illustrated example case, Spring 2010 students also built a new training resource, documenting in detail the creation of an online lemonade business. Finally, students completed Online Business Capability Assessments, where they applied the guidebook to local small businesses, identified e-commerce technology deficiencies and opportunities for the small businesses, and made recommendations.

3.2 Functional Teams
Students were split into five functional groups: a marketing team, a finance and administration team, a publishing team, a web team, and a sales team. The students selected groups and roles depending on their interests. Each team appointed their own team leader and project manager. In addition to the teams, the class appointed an Executive Director from the class, to oversee the activities of the company during the times when the CEO was not available. Though every team had a set of their own responsibilities and tasks that had to be completed for the business, the teams sometimes shared tasks (e.g. content production and prospect list compilation) to allow large, parallelizable tasks – that would be too burdensome for a single team – to be split amongst the entire class.

The instructor, along with a student Executive Director divided tasks amongst teams. Within teams, team leaders acted as project managers and allocated tasks. To adjust for the over abundance of manpower, multiple redundant solutions (e.g. marketing campaigns or software implementations) were created. Candidate solutions were compared, and the best solution was deployed live. The five different teams communicated and coordinated with each other via their team leaders and the central student Executive Director. All

teams were able to log tickets (service requests) with the web team via an online ticketing system. Teams consulted the Executive Director if one team's decision affected another team, and in the case of unresolved conflict, the instructor made the final decision.

The Finance and Administration Team was responsible for administration of the business, in accordance with government regulations, as well as business budgeting and planning. The Sales Team was responsible for communicating with prospective sponsors. The Marketing Team handled both traditional off-line marketing tasks, and online marketing campaigns, targeting potential sponsors, readers, and distributors. The Publishing Team (Print Team) handled development of the guidebook's layout and content. The Web Team configured all the information technology applications required to successfully operate the Online Business Guidebook organization.

Students were encouraged to use available turnkey hosted ("Software as a Service") internet services – such as shopping carts, content management systems, email marketing tools, web analytics suites, issue tracking systems, blogs, wikis, discussion forums, and others – rather than undertaking the laborious task of developing proprietary, made-from-scratch transaction processing and executive information systems themselves. The web team was responsible for deploying the hosted services required by other functional teams. The recent surge in popularity of Software as a Service (SaaS) has enabled students to deploy internet-based business information systems without the traditional system development life cycle required in the past to create bespoke internet systems (DeVilliers and Abrahams, 2000). Bespoke systems are custom-made, by programming individual components – for example, in the early days of the internet, students might take weeks or months to develop a shopping cart system as they individually programmed each web page in languages such as PHP, Java (Java Server Pages), C#, or Visual Basic (Microsoft's Active Server Pages). In contrast, the commoditized, hosted (SaaS) systems now widely available have been programmed by a 3rd party: so students can now, for instance, easily create a fully functioning shopping cart by simply creating an account at a hosted shopping cart vendor's site (or downloading the software to deploy on their own web server). Use of extant hosted solutions was strongly encouraged for this class.

3.3 Schedule

Over a 16 week semester, the class met twice a week for a total of 2.5 hours per week. At the beginning of each semester, students were provided with a history of the organization, a copy of the most recent guidebook edition, and training materials (e.g. with usernames, passwords, log-in URLs, and tutorial screen-captures) from the previous semester. In the first week of classes students were introduced to the goals of the organization and prior work completed. Students were then given the opportunity to present their interests and experience and choose preferred teams. During the second week of classes, each team appointed leaders, established their plans for the semester, and allocated tasks to team members. Teams then presented their plans, task assignments, and schedules to the instructor and class, for feedback. All students participated in content production for the

guidebook, and each student was assigned a topic to research. During the remainder of the semester, one student was selected each day to make a presentation on their assigned topic. Topics were ordered in the sequence required to start a business, so that functional teams could learn about a particular topic during class, and then go about implementing the knowledge learned in practice for the organization. For example:

- a student presentation on the topic "e-mail marketing" was followed by the design and implementation of real e-mail marketing campaigns, using MailChimp.com and Ace of Sales, by Marketing and Sales team members.
- a student presentation on "web analytics and website traffic monitoring", was followed by implementation of both Google Analytics and Awstats monitoring for businessguidebook.org.

4. LEARNING OBJECTIVES

The instructor set a number of specific *learning objectives* for the class.

Some learning objectives are recurring, meaning students encounter them in every semester. Primarily, these recurring objectives are for ongoing *operational* and *management* tasks. For example, in every semester, students will:

- Learn how to manage a web hosting account (e.g. upload files via a control panel; add directory aliases; add email aliases for new students; perform backups)
- Learn how to edit web content, using a Content Management System (e.g. Joomla)

Some learning objectives are non-recurring – once one semester has completed these, new students typically do not repeat the task, unless they wish to experiment with an alternative service provider. These non-recurring learning objectives are primarily once-off *installation* or *setup* tasks, and include:

- Learn how to register a domain and create a new web hosting account
- Learn how to install a content management system

Though these set-up tasks are usually 'once off', there are occasions where future semesters might be required to redo these tasks and hence re-accomplish these learning objectives. For example, in semester three, following occasional problems with the current hosting provider, students learned to re-install the website, in parallel, on a new host, to determine whether the alternative service provider provided better reliability (unfortunately, it did not). Occasionally, the instructor might require students to redo "once-off" tasks already completed, simply to gain experience with new vendors, who offer alternative features, or to gain experience with different installation processes.

Many small e-commerce sites are set up by a small number of dedicated individual with good continuity. This project was the reverse: many students working in a short period of time with low continuity. As students were often unfamiliar with required technologies, new implementations were sometimes delayed as students got to grips with the environment. However, good tutorial documentation (with usernames, passwords, login URLS, and screen-captures for all hosted solutions used by prior classes) allowed successive

semesters of students to benefit from prior work by earlier graduates.

5. EVALUATION METHODS

Separate evaluation methods were used to gauge the performance of the individual students, the teams, and the organization as a whole. To assess the course itself, students completed course evaluations at the end of each semester. A post-semester follow-up survey was completed a few months after the students had graduated.

5.1 Student Evaluation

Students were evaluated based on their *effort* and *contribution*. Effort was assessed through day-to-day log files which students were required to maintain to document the goals they worked towards and the tasks they completed towards those goals each day.

5.2 Team Evaluation

Teams were assessed based on team *plans* at the start of the semester and team *results* at the end of the semester:

- Team Planning Presentation: Each team was required to document their plans for the semester and list which team member was assigned to each task, and what their deadlines were.
- Team Results Presentation: Each team was required to document their accomplishments over the semester, including screen-captures, showing what each team member did.

5.3 Organization Evaluation

We tracked the success of the organization by monitoring *revenues*, *distribution numbers*, *website visits*, *media publicity*, and important *website metrics* (internet business ratios) such as: *cost-per-visitor*, *cost-per-lead*, *cost-per-customer*, and *response rate / click-through-rate* (for each campaign); *conversion rate (for each goal)*, *bounce rate* (for each traffic source), *top traffic sources*, *top keywords*, and *profit per 1,000 visits*.

Note that, for each of the metrics listed above, we recommend that students be evaluated on the <u>ability to compute</u> the metric, rather than on the actual metric score, since the score is often dependent on external market forces.

5.4 Course Evaluation

At the end of each semester, students completed a standard university course evaluation.

Prior to the Online Business Guidebook, students were required to form small teams and start their own real businesses, using course materials provided by the instructor. Students in these earlier instantiations raised some concerns. For instance, they felt that starting a new business in a small team (2-3 students) was overwhelming, particularly in a single semester. Also, recruiters did not always favorably view student leadership of a for-profit start-up, and sometimes expected that entrepreneurially-minded students would not be well suited to a corporate career. Earlier experience from previous courses (Abrahams, 2010) also indicated that for-profit startups were regularly prone to infighting amongst students, over profit shares.

In response to this feedback and experience from earlier instantiations of this course, it was decided, to involve all students in the creation of a single entity (The Online Business Guidebook), straddling multiple semesters, and that this entity be non-profit to demonstrate students' community-mindedness to recruiters.

However, students who participated in the Online Business Guidebook classes generally provided marginally weaker evaluations of the course and instructor than before the Online Business Guidebook. Prior to the guidebook, students launched online businesses of their own choosing, with guidance from the instructor. Though these business typically did not achieve the level of operational maturity of the guidebook (Abrahams, 2009), students clearly enjoyed the freedom and satisfaction of selecting and building their own concept. Following launch of the guidebook, course ratings generally declined slightly, particularly for large sections, who raised significant concerns about completion of "busy work" (e.g. creating prospect lists or cold-calling sponsors), methods of evaluating student performance, clarity of assignments, educational value of assignments, and contribution to their knowledge. These complaints invariably resulted from IT students having to complete non-IT-related tasks in order to operate a real business.

Students had contrasting views with regard to whether this course was appropriate at the senior level or for an earlier experience. For example, one student commented:

"[This class was extremely beneficial and] I wish I had it earlier in my career"

whereas another wrote:

"Best possible capstone BIT experience"

Evidence from Neck and Stoddard (2006) suggests that a class of this nature may also be suitable for freshman students.

5.5 Post-Semester Follow-up Survey

A post-assessment follow-up survey was sent to graduates from the Fall 2008 and Spring 2009 classes, a few months after the students had graduated. The survey instrument used was an adaptation of a guided reflection model by Ash and Clayton (2004) that assists student in articulating their learning. Most students indicated that they derived gains from their service learning experience in all three areas: personal (80% felt they derived personal gains), civic (90%), and academic (90%).

6. A REPLICABLE MODEL, WITH SPECIFIC LEARNING OUTCOMES FOR E-COMMERCE CLASSES

Borrowing from Kolb (1984), and based on our case study reported above, we now propose a replicable model for experiential learning for e-commerce classes. Our model facilitates attainment of the learning levels defined in Bloom's Taxonomy (Anderson and Krathwohl, 2001), by Information Technology students. Figure 4 shows the replicable experiential learning model we propose specifically for Information Technology students.

The cycle begins with the identification of topics to research and implement ("*Identify*" step). In the case of Online Business, topics included web hosting, payment processing,

pay-per-click advertising, email marketing, affiliate market-ing, and dozens of others – see the Table of Contents of the Online Business Guidebook (Singh, 2009; Lovett, 2010) for a comprehensive, but not exhaustive, list of candidate topics for e-commerce classes.

Next, ("*Assess*" step) various vendors in a given topic (category) are assessed. For example, different email market-ing vendors are compared.

In the "*Deploy*" step, one or more vendors are chosen, and accounts are created on their hosted services.

The "*Implement*" step involves the creation of one or more campaigns using the software: for example, alpha and beta email campaigns, or alpha and beta pay-per-click cam-paigns.

These campaigns are compared to each other ("*Eva-luate*" step) – e.g. evaluating return on investment, imple-mentation quality, or other metrics. Implementation and Evaluation provides a fun opportunity for students to launch and assess competing campaigns.

Revisions are suggested for future iterations ("*Revise*" step).

Knowledge learned during assessment, deployment, im-plementation, evaluation, and revision, is continuously do-cumented during all phases ("*Document*" inner loop).

Project Management is foundational to all steps: tasks must be identified, assigned to students, and scheduled.

The cycle repeats as students and instructor in the current or successive semesters identify newly emerging technology areas ("Identify" step), such as Mobile-Commerce, Location Aware Services, and other still-maturing technologies. Given the rapid pace of change in hosted services, knowledge will naturally evolve over successive semesters as service provid-ers improve their offerings.

Figure 3: A Replicable Experiential Learning Cycle for Information Technology Students

Note that, unlike a real enterprise where labor cost is significant, in a classroom scenario, to allow successive gen-erations of students to get implementation experience, re-dundancy is permissible and encouraged – e.g. redundant hosting accounts can be implemented (even if a working account already exists) so that new generations of students can acquire practical experience with a different technology (e.g. alternative web hosting providers provide different web administration interfaces like CPanel or Plex).

7. FUTURE PLANS

We are currently experimenting with *alternative content production models*, such as crowd-sourcing wikis, blogs, and discussion forums. We expect these will complement, not replace, the hardcopy edition.

Slotte and Herbert (2006) found that e-learners frequent-ly complain about having to sit in front of a screen, and that the wide range of information makes it hard to decide what to study. Mangen (2008) comments that reading online is not as effective as the printed word, because the process of read-ing online involves so much physical manipulation of the computer, that it interferes with the readers ability to focus on the content. Recent research at the New Literacies Lab at the University of Connecticut has found that online compre-hension is complicated by need for more self-directed text construction (Coiro and Dobler, 2007), compared to books which are already organized and synthesized. A study by Allen (2008) indicated that three quarters of students prefer a printed textbook to a digital textbook, and 3 out of 5 students would use a print copy even if a digital book were free. In contrast, Kane and Fichman (2009) advocate the use of wikis for teaching. Further, an investigation by Leu et al (2007) revealed that online vs. offline reading comprehension dif-fered markedly amongst different individuals.

We are also contemplating *alternative projects*, for edu-cators considering employing this "learning by doing, and learning by teaching" approach in their e-commerce class-rooms. For instance, students can accomplish similar learn-ing goals to those shown earlier (§4), by establishing new specialty businesses online. For example, students can easily establish a new online lemonade business, or a new online toy shop.

8. CONCLUSIONS

The Online Business Guidebook initiative provided students with an opportunity to learn about, and to teach others about, starting a web-based organization from conception to opera-tion. The class gives hands-on experience in conducting and participating in various functions in a live business.

To assist educators in applying this learning approach to their e-commerce classrooms, we have proposed various learning objectives (see §4) that can be used to set learning goals. We have also proposed generic methods of evaluation (§5). We provided a replicable model for information sys-tems educators (§6) that encourages students to identify technologies, assess various vendors and deploy a chosen solution, implement and evaluate campaigns, and, finally, educate their peers on what they discovered and accom-plished. Finally, we have considered alternative content pro-duction models and additional projects that educators can use to implement our learning model (§7).

A number of challenges were encountered with our learning model. Perhaps most problematically, students were dissatisfied with completing monotonous tasks required to operate the real business, such as data gathering tasks and cold-calling campaigns. To maintain student interest and enthusiasm, we recommend that students be allowed to start an internet retail venture of their own choosing, using the guidebook as a basis. Further, students would benefit from

conducting assessments of mature businesses so that they are familiar with the issues encountered by both start-ups and fully-fledged internet businesses.

Information systems educators who teach e-commerce or entrepreneurship courses, and their students, can download the free electronic edition of the guidebook, or request hard-copies, at: www.businessguidebook.org

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