Developing Student Competencies in E-Sourcing Technology Using a Reverse Online Auction Project

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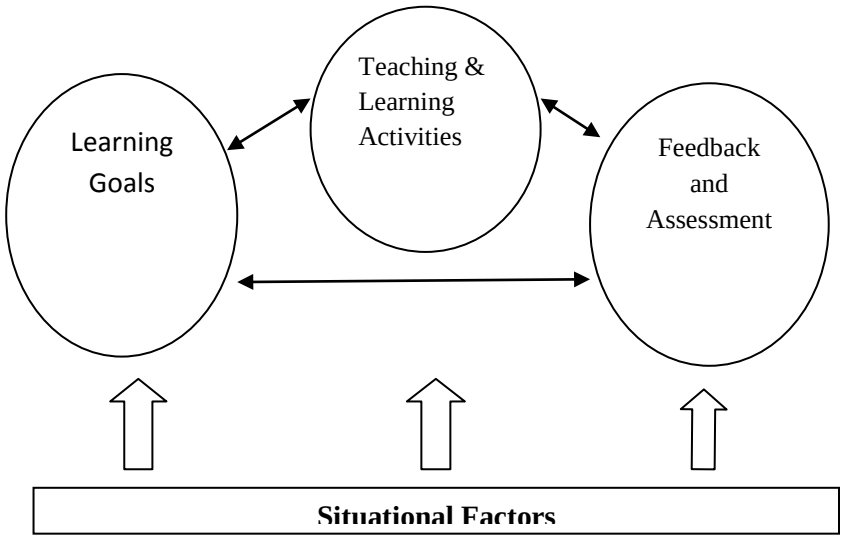
Abstract. As companies face the dual tasks of managing an ever expanding supply chain and reducing costs, technology becomes an indispensible tool for sales and supply management professionals. Graduates entering the workforce are expected to have a working knowledge of the enabling technologies that are available to assist in the performance of their professional duties. Electronic auctions are increasingly being used by firms as they seek to improve firm financial and operational performance. Integrating the knowledge and use of online reverse auctions as an e-sourcing tool can enhance the competencies and job performance readiness of business school graduates. However, educators are cautioned that under the pressure to integrate new technology into student coursework, one must avoid rushing through a comprehensive instructional design process. We present the development of a course project using online reverse auctions for sourcing needs. The course project is developed using an established instructional design framework that incorporates identifying important situational factors, establishing learning goals, developing teaching/learning activities, and incorporating feedback and assessment. This paper describes how the project was designed and implemented.

Introduction. Organizations are increasingly utilizing technology to source a variety of goods and services from suppliers (Kaufman and Carter, 2004). Many transactions that could be conducted as traditional face-to-face negotiations are now candidates for online, real-time auctions between buying organizations and two or more invited suppliers. The emerging technology for sourcing, such as an on-line bidding process, is often augmented with traditional face-to-face meetings, teleconferencing, and/or emails. With every major industry using e-sourcing technology (Jap, 2002), the rapid growth of this sourcing effort underscores the need to expose business students (specifically, both professional sales and purchasing students) to its influence --- opportunities, issues, and consequences -- on buyer-seller dynamics. The desired result of this exposure is to enhance the competencies of the graduates as they prepare for the duties and responsibilities assumed as supply chain professionals. Thus, this paper describes a business school curriculum that was updated to include online reverse auctions. The change in the curriculum was made using an established instructional design framework that incorporates identifying important situational factors, establishing learning goals, developing teaching/learning activities, and incorporating feedback and assessment.

Applying Instructional Design to an E-sourcing Project. As a contemporary leader in faculty development focused on teaching and learning, Fink's model (Exhibit 1) is used to develop the e-sourcing project. Fink (2003) argues that a learning-centered approach to designing courses provides the best chance for significant learning experiences to occur. He notes that in contrast to a content-centered approach to learning where the focus is on what to cover or put in a course, the learning-center approach focuses on what students can and should learn in relation to a subject and then how such learning can be facilitated. The distinction is appreciated when one understands that what to put in a course may be controlled by the curriculum committee or administrators of the university. But how to facilitate the instructional event is the responsibility of the faculty member.

Exhibit 1 – Fink (2003) Model of Integrated Course Design



Instructional design focuses on how to best facilitate the instructional event and, as a discipline, is a branch of knowledge concerned with research and theory about instructional strategies and the process for developing and implementing those strategies (Smith and Ragan, 1999). The overall objective of instructional design is to serve the learning needs and success of students through effective presentation of content and fostering of interaction. Andrews and Goodson (1980) provided one of the first comprehensive comparisons of models of instructional design. Today, as instructional design models are adapted for situated learning with technology, the assessment components may be radically different (Young, 1993) however, the basic features of instructional design are stable (Smith and Ragan, 1999). The basic features of all instructional development models include four components: 1) identifying situation factors, 2) learning goals and objectives identification, 3) content and delivery development, and 4) evaluation and redesign. Fink (2003) provides a detailed analysis of theses four basic steps in his book entitled *Creating Significant Learning Experiences: An Integrated Approach to Designing College Courses.*

Step 1: Identifying Situation Factors

In the instructional design process, the situational factors are the setting and audience analysis backdrop in which the learning will occur. The teaching and learning environment is a mid-size, public university in the Southeastern United States. The University is a public, state university with a homogenous student body consisting of eighty percent of its students from the surrounding counties in the state. A majority of the students are first generation college students with the expectation that their college education prepares them for entry level jobs in corporations or the government. The idea that they could apply the learning outcomes from this course was a very relevant factor for these students.

Instructional design theory proposes that the characteristics of the learners should be reviewed as part of the situational analysis (Fink, 2003; Smith and Ragan, 1999). Learners' prior knowledge and experiences relevant to the subject must be considered. In addition, designers need to consider what are the goals and expectations of the students. Given that the courses were undergraduate courses offered to juniors and seniors as major electives, the design of the project could incorporate the prerequisite course work such as basic computer information knowledge as well as the general body of knowledge required for freshman and sophomore students.

Another situational factor that must be addressed is the expectations placed on the course by the university, the college, the department, and other stakeholders of the university like recruiters and alumni. The business school is held to the standards of the accreditation organization to which it belongs. In addition, corporate partners have verbalized an interest in certain skills and competencies of graduates from the college. These general contextual requirements were considered in establishing the expectations and the rigor of the project.

The nature of the subject is another situational component that must be considered in designing effective learning experiences. The project was embedded in two courses, scheduled at the same time and day during the semester – The Purchasing and Supply Management course and the Professional Selling and Sales Management course. The Purchasing and Supply Management course emphasizes the importance of the procurement function for efficient operations, product quality, and supply chain integration. The issues of supplier selection, performance measurement and relationship development/ management, and their impact on the firm and fulfillment of customer expectations are emphasized. The Professional Selling and Sales management course focuses on the functions and skills surrounding the personal selling effort such as developing persuasive communication skills in a buyer- seller context. Given the situation in which the university had dedicated courses for both sides of the buyer-seller dyad, an opportunity to integrate the e-sourcing project into both courses was available and appropriate (Baker and Song 2008; Carter and Stevens 2007).

Given that e-sourcing is an applied science that is becoming more and more central to business strategy, the integration of a technology based e-sourcing project across two applied disciplines (purchasing and sales) added realism to the course work as well as an active learning opportunity. The fact that two courses were available to integrate into an e-sourcing project is an important element in the design of the course. Having only one set of students would simplify some aspects of the learning design yet limit some of the realism of the buyer-seller dyad, and subsequently some of the effectiveness of the learning.

In the business school the undergraduate classes are scheduled to meet either three times a week for fifty minutes or twice a week for one hour and twenty minutes. On rare occasions an undergraduate course may meet once a week for three hours. For the e-sourcing project, a twice a week, one hour and twenty minute schedule was requested. This situational condition was requested because of a desire to bring in practitioners to discuss e-sourcing. The faculty felt that the longer class times would allow for the practitioners to present information for an hour and the session would be augmented with a fifteen minute question and answer session.

Another physical component is the type of classrooms that would work best for the delivery elements. A question of whether to use a computer laboratory, or a traditional classroom that was wired for laptop computers had to be answered. We opted to use a traditional classroom and access the computer laboratory at specific points during the semester. The technology component of the semester-long course encompassed about 25% of the time. Since all of the instruction was not computer based we felt that students would be less distracted in a traditional classroom setting during the days when the technology was not utilized.

The number of students taking the courses also has to be considered. Historically the ratio of students in the purchasing and supply chain course to the number of students in the professional selling course is 1:3. This ratio has been consistent for several years. This ratio was found to be effective for structuring the reverse auction bidding since it allowed each of the students role-playing as a "purchasing agent" to have the opportunity to interact with three students role-playing as a "supplier."

Finally, from an instructional design viewpoint, characteristics of the teacher should be reviewed. Smith (1996) explains that as today's education process pushes students to the center, the teacher's role changes to that of facilitator, guide, and coach – not the primary source for knowledge. A teacher's knowledge and experience related to the course content as well as classroom management is important. Yet, a teacher's ability to help students be active participants in the process of finding, organizing, analyzing, and applying information in novel ways is also significant. The faculty, as a situational factor, like the others can present limitation or opportunities for the learning experience. Given that the faculty for this project had recent significant field interactions is an asset in the instructional design process. The purchasing faculty was certified in purchasing management. The sales faculty had recently completed a faculty internship with a fortune 500 company. During this intensive experience the faculty member interacted with the sales force on a daily basis.

Step 2: Establishing Learning Goals

Instead of learning topics – the focus of traditional content-centered instructional design, our goal was to consider how the course will impact the student as an entry level supply chain professional. As recommended in a learner-centered approach to instructional design, we asked what will distinguish students who have taken this course from those who have not. Our learning goals fell into five major categories: 1) foundational knowledge, 2) learning how to learn, 3) application of knowledge, 4) learning about oneself, and 5) relationship building. A course map is presented in Table 1 to connect learning goals and learning activities.

From a foundational knowledge standpoint we conceded that a major goal was that the e-sourcing project will offer undergraduate students a look at the practices of organizations considering and using reverse auctions as an e-sourcing tool. In addition we wanted the students to gain from the course understanding of the fundamentals of e-sourcing and its impact on the sales and purchasing

functions of the firm. We also wanted students to know the history of reverse auctions and to be familiar with applications of reverse auctions across industries.

For the second learning goal category we wanted students to understand how to inquire about a new subject and how to explore a new technology. We wanted to provide the student the opportunity of conducting independent research and being a self-directed learner. Forman (1995) declares that we live in a world where our body of knowledge is doubling every decade and thousands of scientific articles are published daily. Thus, students need to become an active part of the learning community where they learn how to learn and collaborate with the teacher, peers, and experts to add to their base of knowledge. Smith (1996) argues that innovative classroom approaches coupled with "appropriate technologies" set the stage for flexible learning environments where students understand learning occurs and how to create their own, eclectic learning techniques. In effect, our goal was to foster a customized self-learning environment.

Table 1.
E-sourcing Project Course Map and Planning Guide

Learning Goals for Course/Module	Teaching-Learning Activities	Assessment & Feedback
1) Foundational knowledge – understanding and remembering information and ideas	Lecture-discussion Independent research papers In-class Speakers Negotiation exercise Case analysis Research paper presentations	Pre-test survey Post-project survey Oral presentations Written research papers Final case exam
2) Learning how to learn – becoming a better student through self directed inquiry	Independent research papers Online tutorial assignment	Quality of reference material used for research papers Online tutorial learning assessment
3) Application of knowledge – practicing desired skills	Develop/Respond to RFQ Reverse auction software training "Live" reverse auction bidding	RFQ evaluation Web-statistics of "live" bidding response behavior
4) Personal development - Learning about oneself and/or others	Reflection on Negotiation Style Reflection on Technology Use Reflection on buyer-supplier role	Reflection paper evaluation
5) Relationship building – connecting ideas, people, and different aspects of life	Pre-bid face-to-face meeting Post-bid face-to-face meeting	Video-taped meeting role-play evaluations

In terms of application of knowledge, in our third category of learning outcomes we wanted students to participate in a "Live" Bid day exercise (bidding rounds and tactics). We wanted our students to develop (purchasing students) and respond to (sales students) a request for proposal. In addition, we wanted the students to be familiar with a software program specifically developed for the reverse auction process.

At the undergraduate level, a primary form of competency development within the curriculum is information-based; what Habermas (1970) referred to as technical learning. Pedagogically, technical learning is achieved through identifying the specific set of concepts and behaviors needed to achieve a level of competence. However, Nirenberg (2003) criticizes the technical and mechanistic pedagogies used in business schools. He likens instruction that emphasizes the memorization of concepts to driver education classes that do not place the student behind the wheel of a car. He argues that students will know much descriptively about complicated models but nothing about how to use them. To counter the limitations of mechanistic pedagogies, experiential education is increasingly important pedagogical tool within colleges and schools of business at both the undergraduate and MBA levels (Quay 2004). Thus, it was critical to incorporate an experiential or hands-on component to this project.

For the fourth category of learning goals, learning about oneself, we wanted to add a reflective component. Here we hoped students would address their comfort with technology as well as comfort with the negotiation process. Given that purchasing and professional selling are the jobs that they are preparing for, we wanted students to reflect on their perceived fit with their respective profession. We were striving to develop an innovative classroom approach which positions learning as a continuous process grounded in experience, or more explicitly an iterative process in which internalized reflection follows concrete experience, resulting in an adaptation revealed in further reflection and experience (Quay, 2004).

Building relationships is an important learning goal for students preparing for boundary spanning positions. Specifically we want students to understand the real-world issues related to who gets invited to bid and how to get invited to bid. Here the concern is for a clearer connection of the importance of relationship building even in a technology-oriented interaction. We feel that the students need to understand that beyond the computer hardware and software of the reverse auction technology, one has to connect as people (Carter and Kaufmann, 2007).

Step 3: Teaching /Learning Activities

Learning activities were created that linked to the learning goals to foster significant learning. We used lecture and discussion to present basic terminology and concepts. We invited in practitioners to discuss e-sourcing in general and reverse auctions in particular. At the beginning of the course, from a foundational knowledge standpoint we assigned research papers for the students to gain from the course an understanding of the fundamentals of e-sourcing and its impact on the sales and purchasing functions of the firm (Foster and Lin, 2005). We also wanted students to know the history of reverse auctions as one of the contemporary e-sourcing options. Finally, we wanted students to be familiar with applications of reverse auctions across industries.

For the second learning goal category we wanted students to understand how to inquire about a new subject. We wanted to provide the student the opportunity of conducting independent research and being a self-directed learner. Table 2 is a summary of the assigned research papers.

Table 2 – E-sourcing Project
Assigned Research Papers and Presentations

1. The objective of the first research paper is to become familiar with the broad area of e-business. The topic areas which you will investigate include (10 pages):
    - a clear definition of e-business
    - what are the advantages and disadvantages of using e-business
    - what technologies mat be used
    - the relationship between logistics and e-business
    - other related topics of importance to the success of the firm
2. The objective of the second research paper is to distinguish the differences between (3 pages):
    - RFQ
    - RFP
    - RFI
    - Sealed Bids
3. The objective of the third research paper is to report (8-10 pages):
    - the product/service specifications of the selected product and service
    - the identity of 3 potential suppliers for the product and the service
    - the evaluation of each of the suppliers according to supplier criteria using either the categorical method, the cost-ratio method, or the linear averaging method
4. The objective of the fourth research paper is to distinguish the differences between traditional purchasing methods and "e" purchasing methods (8-10 pages).
    - the differences
    - the advantages and disadvantages of each
    - how would you determine the appropriate application for each
    - integrating traditional and "e" into a comprehensive purchasing strategy

The objective of the first research paper is for students to become familiar with the broad area of e-business. The objective of the second research paper is for students to be able to distinguish the differences between a request for quotes (RFQ), a request for a proposal (RFP), a request for information (RFI), and a sealed bid. The objective of the third research paper is for students to become familiar with evaluation criteria for suppliers. The fourth research paper requires students to distinguish between traditional purchasing methods and "e" purchasing methods (Gattiker, Huang, and Schwarz, 2007).

Along with the assigned research papers, independent analysis and critical thinking was required by students for a business situation reported in the local newspaper (Harrington, 2005) entitled "Three local firms asked to bid for Dell Construction." As part of the final examination administered in the courses, students were asked to analyze the opportunities and challenges for a firm anticipating using a reverse auction bid to choose a supplier. In addition to the case, the final examination included a post assessment of the students' perceptions, attitudes and experience concerning online auctions.

In addition, for the second learning goal category we wanted students to understand how to explore a new technology. We wanted to provide the student the opportunity of being a self-directed learner in the context of a technology-driven learning experience. Thus students were required to complete

an on-line tutorial for the use of the reverse auction program. The online tutorial was assigned prior to hands-on computer training offered by the software manufacturer.

For the third category of learning outcomes, the application of knowledge, we planned a "Live" Bid day exercise. We wanted our students to experience developing (purchasing students) and responding to (sales students) a request for proposal. In addition, we wanted the students to be familiar with software specifically developed for the reverse auction process. A one-year user's license was purchased for RFQHosting (www.rfqhosting.com), a privatized web-based system, developed and hosted by Roanoke Electric, LLC, that enables businesses to purchase products and services using electronic commerce. RFQHosting is designed to connect suppliers (salespeople) with buyers (purchasing agents) via reverse auctions or sealed bidding online, in an easy-to-use electronic format. The RFQHosting bidding process can be augmented with face-to-face meetings and/or emails.

RFQHosting training was facilitated using several venues. First, a one day train-the-trainer session was held for interested Faculty and Staff. Next, an in-class presentation was designed and held early in the semester where an overview of reverse auctions was presented by RFQHosting staff to the combined sales and purchasing class at the start of the semester. After the students completed independent research and article reviews about reverse auctions during the semester, the students were required to access and complete the on-line tutorial. Following the completion of the on-line tutorial, the staff of RFQHosting held another on-site training session with the students.

The sales and purchasing class students were trained separately in computer labs using a "mock" reverse auction bidding session. The independent research and article review assignments completed earlier in the semester were used as preparation for a "live" bidding session. The instructors selected the industry and provided the parameters of the products and services to be open for bid. The purchasing class was required to prepare an RFQ and post it to selected suppliers (sales class students) via RFQHosting. The sales class was required to respond to it over the course of a pre-disclosed window of time in which the bidding session was open.

The students were given the day and time that the bid window would be open. At the top of that hour the students had to post their bids and manage the continuous bidding information being fed to them via real time access to bid decisions. During that hour they had the opportunity to respond to the bidding information, resubmitting lower bids and asking questions of the purchasing agent responsible for the RFQ.

For the fourth category of learning goals, learning about oneself, we wanted to add a reflective component. Here we hoped students would address their comfort with technology as well as comfort with the negotiation process. Given this is the career preparation and an applied project; we also wanted students to reflect on their perceived fit with their respective profession. Students had an exercise in the early part of the course where they were asked to reflect on their negotiation style. Midway through the semester, a technology use reflection was encouraged. Students had an exercise at the end of the course where they were asked to reflect on the reverse auction project as a whole. The students were required to write a final reflections paper to describe the process and outcomes related to participating in the e-sourcing project.

Relationship building is an important competency area for students preparing for boundary spanning roles such as purchasing agents and professional salespeople. In a reverse auction context, specifically we want students to understand the real-world issues related to who gets invited to bid

and how to get invited to bid. Here the concern is for a clearer connection of the importance of relationship building even in a technology-oriented interaction. We feel that the students need to understand that beyond the computer hardware and software of the reverse auction technology, one has to connect as people. Thus students were assigned a face-to-face meeting to obtain feedback from the purchasing agent about the bid process. In part we want students to learn about navigating market dynamics and the balance of power from a relationship perspective. The face-to-face meetings will also be used to demonstrate how to conduct professional needs identification sales calls and bid follow-up meetings.

Step 4: Feedback and Assessment Procedures

Students were given pre- and post-assessments of perceptions, attitudes and experience of online auctions**.** A summary of the results is presented in Table 3. The auction awareness survey was based on an instrument developed by Bosnjak, Obermeier, and Tuten (2006) to assess perceptions of bidding, willingness to bid, and bid behavior. The paper and pencil survey was deliberately scheduled for the first day of class and the last day of class. Responses were measured using a seven point likert scale (1 = strongly disagree to 7 = strongly agree). Students indicated an increase in understanding of the theoretical and practical issues associated with the use of reverse auctions. In addition, students indicated that the course experience was positive and will be useful as they become practicing professionals in today's e-commerce environment.

Table 3 – Pre and Post e-Sourcing Project Assessment
1 (Strongly Disagree) to 7 (Strongly Agree)

Reverse Auction Perceptions	**Pre**	**Post**
1. I understand how the reverse auction bidding process works.	1.70	6.30
2. Non-price attributes (such as quality or delivery terms) can be used in reverse auctions.	3.60	5.50
3. Buyers and Sellers should communicate after the reverse auction process finishes.	3.20	5.00
4. Over time reverse auctions are less effective at making good deals.	2.90	5.50
Course Experience		
5. The experience of participating in a reverse auction is valuable.	3.80	5.70
6. I think learning about reverse auction will be a valuable experience.	4.60	5.90
7. I hope to learn more about the reverse auction after the course ends.	4.70	5.80
8. I am satisfied with the reverse auction being a part of this course.	4.20	5.20
Usefulness		
9. I intend to participate in reverse auctions after this course	3.20	5.60
10. The reverse auction experience will be useful information for me to apply after this course ends.	3.90	4.30
***Results based on 30 Professional Sales and 10 Purchasing Students**		

Limitations and Conclusion. The primary goal of the e-sourcing project was to provide students with an understanding of the motivations, challenges, and experiences of buyers and sellers using online reverse auctions based on a Business-to-Business context. The underlying rationale of asking students to participate in a reverse auction project was to help students acquire the capacity to act as a practicing e-commerce professional in the buyer and/or seller role. The use of a comprehensive instructional design guided the development of learning goals, learning activities, and assessments while accounting for contextual factors. The learning activities were assigned across a 16 week semester timeline.

The development of the e-sourcing project for undergraduate college students was limited by several factors. The make-up of the university's student body, the accreditation status of the business school, and the class size are factors that motivate and in ways constrict the design of the course. In addition, in an effort to restrict the focus to the topic of reverse auction, the faculty team decided from a project perspective to limit the connection of reverse auctions as an e-sourcing strategy with other possible sourcing strategies. However, as professionals the relationship established between buyers and sellers are still an important element in e-sourcing regardless of the technology infused into the process. To further this learning outcome we integrate face-to-face meetings with the e-sourcing bidding process.

In conclusion, as companies face the dual tasks of managing an ever expanding supply chain and reducing costs, technology becomes an indispensible tool for sales and supply management professionals. Electronic reverse auctions are one example of the technology that graduates entering the workforce are expected to have a working knowledge of to assist in the performance of their professional duties. To meet the demands of the workplace we developed an e-sourcing project using a comprehensive instructional design process. Faculty can develop appropriate learning activities in order to create new learning environments that recognize the value of instructional technology in the teaching process and assist firms in their talent management processes as they seek to improve firm financial and operational performance.

REFERENCES

Andrews, Dee H. and Ludwika A. Goodson, "A Comparative Analysis of Models of Instructional Design," *Journal of Instructional Development*, Vol. 11, 3, 1980, pp. 2-16.

Baker, Jeff and Jaeki Song, "Exploring Decision Rules for Sellers in Business-to-Consumer (B2C) Internet Auctions," *International Journal of E-Business Research*," Vol. 4 (1), 2008, pp.1-21.

Bosnjak, Michael, Dirk Obermeier, and Tracy L. Tuten, "Predicting and explaining the propensity to bid in online auctions: a comparison of two action-theoretical models," *Journal of Consumer Behavior*, Vol. 5, March-April, 2006, pp. 102-116.

Carter, Craig R. and Cynthia Kay Stevens, "Electronic reverse auctions configuration and its impact on buyer price and supplier perceptions of opportunism: A laboratory experiment," *Journal of Operations Management*, Vol. 25, 2007, pp. 1035-1054.

Carter, Craig R. and Lutz Kaufmann, "The Impact of Electronic Reverse Auctions on Supplier Performance: The Mediating Role of Relationship Variables," *Journal of Supply Chain Management*, 43 (1), 2007, pp. 16-26.

Fink, L. Dee. *Creating Significant Learning Experiences: An Integrated Approach to Designing College Courses.* San Francisco: Jossey-Bass/John Wiley & Sons, 2003.

Forman, David C., "The Use of Multimedia Technology for Training in Business and Industry."*Multimedia Monitor*, 13, 1995. pp. 22-27.

Foster, Jonathan, and Angela Lin, "Developing Expertise in E-Commerce: A Content Analysis of Students' Knowledge of Online Auctions," *Journal of Information Systems Education*, Vol. 16 (1), 2005, pp.85-91.

Gattiker, Thomas F., Xiaowen Huang, and Joshua L. Schwarz, "Negotiation, email, and Internet reverse auctions: How sourcing mechanisms deployed by buyers affect suppliers' trust," *Journal of Operations Management*, 25, 2007, pp. 184-202.

Habermas, J., *Toward a Rational Society*. Boston: Beacon Press, 1970.

Harrington, Matt , "Three local firms asked to bid for Dell construction," The Business Journal, www.bizjournals.com/triad/stories/2005/01/24/story2.html, Friday, January 21, 2005.

Jap, Sandy D., "Online Reverse Auctions: Issues, Themes, and Prospects for the Future," *Journal of the Academy of Marketing Science*, Vol. 30 (4), 2002, pp. 506-525.

Kaufmann, Lutz and Craig R. Carter, "Deciding on the Mode of Negotiation: To Auction or not to Auction Electronically," *Journal of Supply Chain Management*, 40 (2), 2004, pp. 15-26.

Nirenberg, John, "Toward Leadership Education That Matters," *Journal of Education for Business*, 79 (1), 2003, pp. 6-10.

Quay, J., "Experience and participation: Relating theories of learning," *The Journal of Experiential Education*, 26(2), 2004, pp. 1-5-116.

Schneber, Scott, Donald L. Amoroso, and Antonia Durfee, "Factors that Influence the Performance of Computer-Based Assessments: An Extension of the Technology Acceptance Model," *The Journal of Computer Information Systems*, Winter, 48(2), 2007, pp.74-90.

Smith, Karen L., "Preparing Faculty for Instructional Technology: From Education to Development to Creative Independence," *Proceedings of the 1996 CAUSE Annual Conference*, 1996, pp. 8-3-1+.

Smith, Patricia L., and Ragan, Tillman J. *Instructional design*, 2nd Ed. Columbus: Merrill, Prentice Hall, 1999.

Young, Michael F., "Instructional Design for Situated Learning," *Educational Technology Research & Development*, Vol. 41, 1, 1993, pp. 43-58.