

**A PROJECT BASED MODEL TO DEVELOP AND IMPLEMENT
A CAPSTONE COURSE FOR SENIOR LEVEL
E-COMMERCE AND WEB DEVELOPMENT STUDENTS
(Course Title: Advanced E-Commerce and Web Production)**

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ABSTRACT

This paper involves a model for the teaching of a project-based senior level undergraduate capstone course entitled Advanced E-Commerce and Web Production. The project-based model in this paper is framed around project management. Through the utilization of project management skills, students will learn the major objectives of E-Commerce, Web Site Production, and the creation of Business Plans. This course is focused on hands-on learning. The students will decide to create their own business or help a local community / non-profit business expand on these areas of pedagogy. This project can be completed on an individual or group level.

Keywords: Ecommerce, Web Design, Business Plan, Project Management, Entrepreneur, Teaching, Capstone Course

INTRODUCTION

Individuals are using the Internet more than ever. This growth could be contributed to the increase of Internet phones, such as the iPhone. According to current Facebook statistics, as recently as April 11, 2010:

- There are more than 100 million active users currently accessing Facebook through their mobile devices.
- People that use Facebook on their mobile devices are twice as active on Facebook vs. non-mobile users.
- There are more than 200 mobile operators in 60 countries working to deploy and promote Facebook mobile products.

These statistics about the networking site alone indicate a direct relationship between Internet mobile phones and the increased use of the Internet. This explosion is changing the way businesses run. This revolution is creating a demand for web sites that can be viewed using a cell phone or developing apps for customers to connect to their business web

site more effectively. Therefore, e-commerce and web site design is a field that continues to experience augmentation.

This expansion, coupled with the growth for employees, has created a demand for graduates with a four year degree in this field. Businesses desire to hire employees that can create web sites that are interactive at all levels. The demand to create this interactivity has impacted higher learning institutions. College professors in academia must develop new pedagogies for their e-commerce and web production students.

The course strives to meet the demands of industry by achieving the following objectives set forth in this paper.

- The main objective is for students to demonstrate their project management skills. The student will have difficulty completing this course if project management is not utilized.
- The second objective is for students to apply their knowledge of fundamental e-commerce business concepts. These theories can be expressed through the creation of a business plan.
- The third objective of this capstone course is to apply e-commerce business models to a business. E-commerce business models are changing the way commerce is being conducted through e-business web sites.
- The fourth and final objective concentrates on the principles of effective web site production. It is created with cutting edge or state of the art software. Usability determines if a web site has been designed effectively.

This paper will describe these objectives. It will also provide a model that includes a step by step approach to implementing and teaching this senior level capstone course successfully.

It is recommended that this course be limited to graduating seniors completing their final semester of coursework. This proposal is founded on the basis, as with any capstone course, that the overarching idea is to facilitate students with the transition from the classroom to the workplace.

The course aims to integrate all program learning outcomes. It seeks to prepare graduating students for success in their chosen career and/or provide students with the background to enter graduate school where advanced research is conducted.

COURSE PREREQUISITES

The following required and optional prerequisites were gathered from the Thiel College website. I used them as a basis for this paper and adapted them to fit within the contents of this paper.

REQUIRED PREREQUISITES

CSCI 139 Web Design and Development

This course is an introductory course that provides a laboratory-based introduction to web page design and development. The topics covered in this course include HTML language fundamentals, HTML editors, CGI (Common Gateway Interface) processing, JavaScript programming, and Dynamic HTML.

At Thiel College, students undertaking the e-commerce web development major are required to take this introductory entry level web design and development course. In addition to topics listed previously, students are also exposed to HTML with Cascading Style Sheets (CSS) and basic JavaScripting.

Students learn to write HTML code in notepad and Adobe Dreamweaver. The instructor normally teaches this course by beginning to teach a new HTML code concept in Notepad. The same HTML code concept is then taught again in a following lesson using Dreamweaver.

Finally, the student will complete an assignment on his/her own that incorporates the concept to be mastered using the text editor of their choice. Utilizing this dual method to create and edit HTML code exposes the students to a variety of ways of typing HTML code to produce web sites.

The HTML concepts that are covered in this course include the following:

- Headings
- Paragraphs
- Text alignment
- Bullets & Numbering
- Images
- Hyperlinks
- File management
- Web design and layout
- CSS (embedded and external)

A final project is completed by all students and required to publish their site via a free web hosting company of their choice. Students will also post their website on the Thiel College network ("Course Offerings," 2010).

Math 107 College Algebra or satisfactory placement scores

With programming, it is required that students have mastered a certain level of mathematical concepts. Math 107 is a basic math course that teaches algebra at the intermediate level. The pedagogy in this course includes fractional equations, graphing, exponents and radicals, quadratic equations, and an introduction to logarithmic and exponential functions. Knowing these mathematical applications will assist the student in completing the required programming code in their programming courses ("Course Offerings," 2010).

CS 241 Project Management

A project management is an essential course for college students. It is essential because typically students that are of a traditional college age (18-22 years old) have not been exposed to working in a corporate environment. When working in industry, projects are a constant work in progress. Traditionally, when one project ends, another project begins shortly thereafter. Therefore, students should complete a course in project management to acquire exposure in learning how projects will flow in the workplace.

This project management course is taught at the introductory level. In this course, the topics of discussion include project management organization, theory, methods, techniques and utilizing computerized tools, such as Microsoft Project. Students taking this course will acquire a general background in project management reiterating the fact that students will become prepared for various

jobs in government and industry. They will also be equipped for management positions in various organizations to develop and evaluate projects (“Course Offerings,” 2010).

CIS 201 E-commerce

The introductory e-commerce course at Thiel College introduces the student to concepts in electronic commerce. During the semester, all major e-commerce models, including business-to-business (B2B), business-to-consumer (B2C), consumer-to-consumer (C2C), E-Government and E-Learning are learned. Students will learn how a traditional brick and mortar business can convert or transition to a brick and click business in little or no time at all. For businesses to achieve this transition, certain computer hardware and software must be in place. Thus, current computing technologies will also be lectured upon and this is aligned with current Internet retailing concepts.

Further issues of discussion and exploration are Internet law, ethics, and cyber crime. The teacher of the course will use current case studies to discuss the most current issues e-retailers face in today’s marketplace (“Course Offerings,” 2010).

OPTIONAL PREREQUISITES

CSCI 319 Database Management

This course is an introductory course that discusses issues relating to the design and implementation of database management systems. The teacher discusses major topics, such as database system components, conceptual modeling, database applications, normal forms, and the societal impact of database systems. A vast majority of this places emphasis on the relational data model. Students will be exposed to and required to use a high-level programming language to enable them to write programs to design databases. They will design databases using Microsoft Access and then transition into MySQL where phpMyAdmin will be used to assist with SQL commands (“Course Offerings,” 2010).

CSCI 439 Data Communication and Networks

In order to start a new e-business and experience success in the marketplace, a student with network experience will have a great advantage over an entrepreneur that does not possess these skills. This course is an effective starting point for students because it is an introduction to data communications

principles, network design, and network management. When a student takes this course, he/she will be exposed to topics, such as data communications concepts, terminology, standards, network topologies, and protocols.

Further pedagogy emphasis is placed on the ISO/OSI layered model, as well as error correction and detection techniques, security issues, and compression. The teacher will use specific networks to study. These networks will serve as the illustrations to gain further applied knowledge of these concepts (“Course Offerings,” 2010).

ART 240 Introduction to Graphic Design Graphic Design (Adobe Suite)

If a student in the web design program has entry level knowledge of graphic design, he/she will be able to produce attractive web sites. To gain this knowledge, a student should take this course because it is intended to give an introduction to computer graphics applications to the beginner student. Throughout this course, the teacher will introduce applications of graphic design, tools of the trade, and the requirements that industry demands students to possess. The pedagogical emphasis will be placed on creative problem-solving skills, concept development, and traditional hand/board skills. As far as computer graphic applications, this course will introduce page layout software. The teacher places special emphasis on the aesthetics and functionality of layout, as well as the basic types of images that are included in the organization of a layout.

In my past teaching experience, the students that have taken a graphic design course and/or have prior knowledge of the Adobe Suite will have an advantage in this capstone course. Students that can use several different programs within the Adobe Suite, such as Photoshop and InDesign, have the ability to create unique and modern web sites. The graphic design course aides students in the design and layout principles. Knowing these principles are useful in creating websites that will attract and keep clients on the site; it determines the success of the e-commerce business (“Course Offerings,” 2010).

CIS 211 Interactive Web Programming

As previously mentioned, having an interactive web site will lead to the overall success of an e-business. It introduces the student to concepts in web animation and interactive user interfaces, concentrating on the use of Adobe Flash. The major concepts that are covered in this course include

vector images, drawing in Flash, basic Flash animations, motion paths, movie clips, button states, motion tweening, shape tweening, audio, preloaders, and Flash detection. Flash ActionScripting 2.0 and 3.0 will also be introduced for additional control in creating dynamic interfaces.

The progression of this course is done in a very gradual manner because no prior computer experience with the above topics is assumed. In the beginning, the teacher will present an introduction to Adobe Flash.

Next, the course will progress onto drawing shapes, adding text, and creating symbols. As the course continues to move forward, students will then begin creating animations and special animations and how to make a document interactive.

In the final weeks of the course, the students learn how to publish Flash files along with planning and creating a Flash Web site.

As the course comes to a close, a more advanced topic is taught. It is programming with ActionScript 3.0, as well as using Flash components, video, and Flash content. The course provides the student with the ability to become an Adobe certified associate since all major aspects of Flash were covered (“Course Offerings,” 2010).

CSCI 331 Web Programming (Server Side)

This course is an introductory server side programming course. Students enrolling in this course are exposed to and learn how to apply server-side web programming techniques. Several different topics are discussed, including a review of HTML programming, Java Scripting, PHP, and Ajax.

The student will learn these programming languages and then apply them to access back-end databases. Through the access of back-end databases, he/she is able to learn how to make web pages dynamic, create and process web forms, learn different methods of web form validation, creating and using web services, maintaining session state, methods of web application security, and data transfer over the Web via XML.

The student will use XAMPP to provide a local host server with Apache and MySQL. The use of SQL will be learned first through a command prompt and then MyPHPAdmin. He/she will complete a final project that involves designing a web form that checks for validation of user entries, a message that informs the user that their information has been submitted, the

users’ information gets inserted into the database, and finally the student must use SQL to extract certain required queries from their database (“Course Offerings,” 2010).

COURSE ORGANIZATION

Since this course is designed as a capstone course for students in the Web Development major, it focuses on E-Business service in relation to the Internet. The pedagogy includes the influence of E-Commerce, identifying E-Business resources, managing project implementation, developing product Internet/Extranet launches, and marketing E-Business services. Throughout this 16 week course, students will focus on creating one major project. It involves the creating a business or working with a local existing business to create a business plan and a web site. The website will include web applications that will showcase the students’ skills in the creation of dynamic, data-driven web applications, and e-commerce storefronts.

In order to achieve the previous, students will learn the concepts necessary to be able to include shopping carts, product catalogs, product spotlights, wish lists, discount specials, the checkout process, and tracking orders on their course project. They will also learn about the life cycle of a web application project and its necessary documentation, including design and technical specifications. This course was designed to expose students to work a team development environment.

The final aspect of this course involves the student learning how to give technical presentations to the other teams in the course and management audiences. As an additional bonus to the course, students will have constructed a professional portfolio of their work suitable for use in the interviewing process for positions in the field of web development.

In summarizing this course organization, four major parts or areas will be covered:

1. Project Management
2. Business Plans
3. E-Commerce
4. Web Design and Development

Teaching and Learning Environment

A true academic institution is accredited by a governing body organization. Thiel College is accredited by Middle States. One of the current initiatives that Middle States seems to be

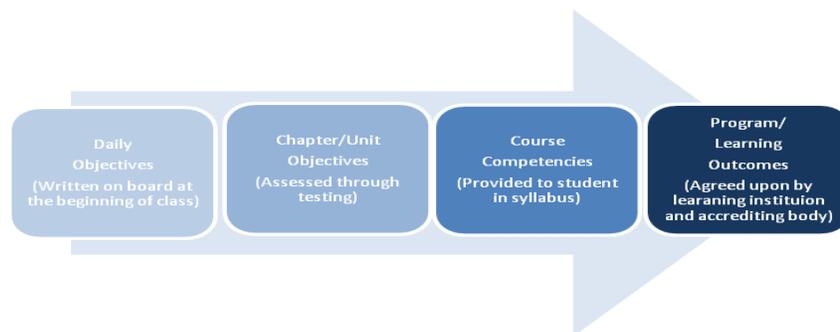
implementing across the board in many institutions is the focus on “assessment.” It involves testing students. By assessing students, a teacher can determine if the competencies have been learned in the course they are teaching. When a degree granting program is established in an institution, learning outcomes are stated to Middle States, which imply that this is what the student will know upon graduation of the program. Learning outcomes are summaries of all the competencies or objectives that should be learned in the courses.

Overall, when a student graduates, the academic institution should be able to accurately determine or assess if the student(s) has learned the competencies in their courses to achieve the program learning outcomes.

In order for a higher learning institution to achieve their accrediting body goals, teachers need to be

teaching their courses effectively. It requires some basic knowledge of knowing how to create an effective teaching and learning environment. To have an effective learning environment and/or teach students the required materials set forth in a course, the teacher should have predetermined objectives or competencies. These objectives are the major pedagogy that the student must learn by the completion of the course. When a teacher creates a layout or course design, he/she should be primarily be concerned with how the students are going to learn the objective for this course, as well as obtain the learning outcomes determined by the learning institution and accrediting institution.

Below is a model that can serve as an aid for a teacher when designing a course. This model will ensure that the teacher is meeting both the institution standards and accrediting body standards.



This course, a capstone course, should reflect on every aspect that the student had learned at their higher education learning institution.

Below, you will find a listing of objectives to be met that covers the four major areas of this capstone course listed above (Project Management, Business Plans, E-Commerce and Web Design and Development).

The following objectives were obtained from the following textbooks used to implement this course. Some were adapted for relevance and time to coincide with the objectives that Thiel College has determined and implemented.

- Felke-Morris, Terry (2009)
- Laudon, K and Traver (2009)
- Napier, H. Albert (2006)
- Kerzner, Harold (2009)

OBJECTIVES: Project Management (Kerzner, 2009)

1. Understand and apply the fundamental principles of Project Management.
2. Develop a project plan for a simple, single team project.
3. Apply standard methods of project selection.
4. Track and report project status.
5. Manage project risks and issues.
6. Evaluate and use project management software.
7. Manage project scope.
8. Apply team building and techniques and manage team dynamics.
9. Apply network scheduling techniques.
10. Apply Quality Management techniques and tools.
11. Develop project cost estimates and manage project costs.
12. Understand the objectives and methods of a Project Office.

OBJECTIVES: Business Plan (Napier, 2006)

1. Create a business plan

Students will learn how to create a business plan through an organized process. This process includes learning and writing the following major sections of a business plan.

- Prepare an executive summary
- Write a mission statement
- Prepare a marketplace analysis
 - Marketing Plan
 - Web Plan
- Create operational, financial, and management plans

Students will also learn:

- Understand legal forms of businesses
- Describe e-business partnerships

OBJECTIVES: E-Commerce (Laudon, 2009)

1. Evaluate the development of E-Commerce and E-Business;
2. Understand the E-Commerce business models;
3. Understand the connection between E-Commerce the Internet and the WWW;
4. Interpret the available methods of E-Business payments and security measures;
5. Understand marketing concepts and communication;
6. Evaluate various ethical, social, and political issues;
7. Interpret what online retailing and content entail;
8. Identify social networks, auctions, portals and their role;
9. Understand supply chain management and collaborative commerce;
10. Design an E-Business plan;
11. Create a web site for an E-Business;
12. Comprehend the key factors affecting E-Business success.

OBJECTIVES: Web Site Design & Development (Felke-Morris, 2009)

1. Develop web pages based on the fundamentals of the HTML language and utilize the following: various formatting techniques, images, links, tables, frames, forms, image maps, sound and video;

2. Create images from the graphics editor that are suitable for presentation on the web;
3. Manipulate images from the graphics editor that are suitable for presentation on the web;
4. Utilize the fundamentals of Cascading Style Sheets (CSS) to format web pages;
5. Recognize the JavaScript language, DHTML and other coding techniques for creating interactivity and advanced effects on Web pages;
6. Describe web design principles and best practices in the areas of graphic design, navigation design, writing for the Web, and usability;
7. Discuss various topics relating to the field of web development including: cross-browser compatibility issues, search engine optimization, and legal issues.

Meeting the above course objectives at the completion of the course ensures that the student did obtain the necessary information promised by their learning institution. How does the teacher know if the student really achieved these objectives? The teacher should then determine if the students have met the course objectives through assessment. Assessment in this course is determined by the final submitted project.

To fully assess a student, the teacher should create a rubric to score the students. It will serve as a guide to ensure that all students are scored fairly. Once a score has been determined, the teacher needs to see if the score meet met the performance standards that teacher set.

Personally, I set my performance standard at 70%. At Thiel College, a 70% is still passing with a C. If the students of the course have met the performance standards set forth by the teacher, then the objectives were met and learned. This, in return, means that the student has acquired the learning objectives set forth by the learning institution and accrediting body.

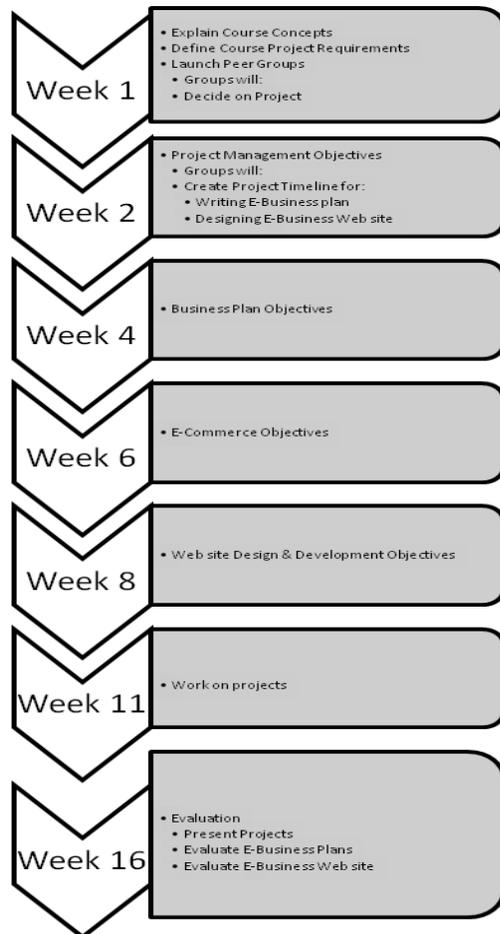
Finally, the teacher should reflect on the course by asking him/herself, is there anything I should change the next time the course is taught? For example, should the teacher place more emphasis on one topic or objective over another?

MODEL OF COURSE COMPONENTS

This paper is designed to run a capstone course in the most efficient manner possible. In order to

accomplish this task, a model should be followed. It is designed as follows.

Course Model



Course Component Details

Week 1 - Objectives

During this first week of the course, the teacher will explain course concepts, define course project requirements, and launch peer groups. The groups will decide on the project they will complete for this course. As mentioned earlier, the students have their choice to create their own business or work with existing local business. The teacher will stress to the students that working with a local business is the better choice. It is a better choice because it will provide them with a greater knowledge base due to the direct impact that their choices will see happening to a real life company and not fictional. The student will also see this benefit on their resume and having a successful job interview.

Week 2 - Project Management Objectives

The second week of this course involves teaching the project management objectives. This is the first major part of this course for the student to learn. Teaching this part will take weeks two and three of a 16 week course. The teacher during these two weeks will cover the necessary pedagogy or the required objectives of the first section of this course. He/she will begin this part with a project management overview and history and business organization structures.

Next, the teacher will discuss how to organize a project team and the groups will form to determine the roles or management functions of the group members. He/she will discuss time management and conflicts and then group will develop a project timeline. The students will develop the project planning skills through this portion of the project and the timeline will display their plan for writing the business plan and designing and developing their website. This project will require the students to design project graphics, pricing, and estimates, as well as cost control if trade off analysis is something that might be needed when making a project decision. Students will utilize Microsoft Project to assist in the completion of this course project. Using Microsoft Project involves adding, changing, deleting tasks, creating charts and reports, and project tracking.

Finally, the teacher will discuss risk management, contract management, quality management, scope management, and project management effectiveness. He/she will place an emphasis on the fact that these are all learning curves that a business and team members will have to learn, adjust, and overcome when dealing with their projects.

Week 4 - Business Plan Objectives

As the course progresses into week three, the teacher will move onto the second part of this course which is part two: writing a business plan. The second part will take two weeks to complete. He/she will discuss the four major sections of a traditional business plan in addition to having a marketing plan and web plan.

Week 6 - E-Commerce Objectives

At this point, the course should be around week six. During the next two weeks, the teacher will teach the following objectives through class discussion and case studies. The major topics of discuss will be understanding E-Commerce business models and

how the models connect to E-Commerce the Internet and the WWW.

Next, the students will learn marketing concepts and how effective communication is essential to the users of their site and what online retailing and content should entail. When a site sells products to a consumer, it must be able to take payments for the goods and services being offered. Therefore, the students will about E-Business payments and security measures that lie within this issue. A few days of class time will be given to evaluating the various ethical, social, and political issues, as well as the supply chain management.

At the conclusion of this third part of this course, the student should have a comprehension for the key factors affecting E-business success.

Week 8 - Web site Design and Development Objectives

During week eight, we reach the fourth major part of this course. It is designing an effective E-business Website. Students will utilize their past programming course experiences to complete this section of the course in addition to further web programming concepts that the teacher will teach over the next three weeks.

Week 11 - Objectives

For the next five weeks, the teacher will provide the students will class time to work on completing the course project. Students will complete all necessary project requirements during this time. The teacher will monitor the students during this five week time frame. He/she will require the groups to meet with the teacher once a week to check on their project status and to answer any questions and provide assistance where needed.

During this time, if a group chose to work with a local company, class time can be utilized to visit the organization. It is advised that the teacher devotes one class time period on giving technical presentations. It is further urged that the teacher will provide help to the students with regards to creating a portfolio and reviewing their resumes and cover letters.

Week 16 - Objectives

During the last week of the 16 week course, the teacher will have the students present their projects to their peers, staff, and faculty members at Thiel

College. This will be a formal and technical presentation that concludes the completion of this course. The students will be evaluated through a rubric. The teacher should ask the other faculty members attending the presentation to evaluate the student groups as well.

Finally, the students will complete a peer evaluation of their group members and the work they completed.

CONCLUSION

The purpose of this paper was to create a model that will provide teachers with a step-by-step approach to developing a capstone course for their higher learning institution. This is the type of course that demands a lot of hard work on behalf of the teacher and students. It is also a course that is never fully developed or completed. It will continue to need revisions as the teacher reflects back on the flow of the course each time it is taught. It tends to receive positive feedback about the material and experiences gained upon completion.

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5. Appendix A

Rubric (Teacher of the course and other faculty can use this to evaluate the groups work.)

Advanced E-Commerce and Web Production Project
Student - Evaluation Form
Semester and Year

PROJECT AS A WHOLE:

Excellent Work: A (5)

Business Plan and Web site was clearly presented and logically organized. All paragraphs of plan and text on slides have clear points with effective organizational. Plan, web site, and presentation are edited with no grammar, spelling, or sentence structure issues.

Good Work: B (4)

Overall, good organization. Almost all paragraphs and text on slides have clear points with effective organizational devices. All typed contents have been edited well and few grammar, spelling, or sentence structure issues exist.

Average Work: C (3)

Business plan and presentation was vague. The plan did not have clear points or effective organizational. Some grammar, spelling, and sentence structure issues were not corrected.

Poor Work: D (2)

Project as a whole was very vague. The plan, site, and presentation contained few points, few organizational cues. Many grammar, spelling, and sentence structure issues still exist.

Very Poor Work: F (1)

Project was not completed to any of the project requirements. The plan, site, and presentation contained no major points. Many grammar, spelling, and sentence structure issues still exist.

PRESENTATION:

Rate the groups team work during the presentation

Not efficient		Some what efficient		Very efficient
1	2	3	4	5

6. Appendix B

Peer Evaluation (All students in the course can complete this evaluation on the peers working in their group, last step in the course.)

Advanced E-Commerce and Web Production Project
Peer Student - Evaluation Form
Semester and Year

Student Name: _____

Group Member's Name: _____

Group Member's Name: _____

Group Member's Name: _____

Overall, how would you rate your experience this semester?

Excellent **Satisfactory** **Unsatisfactory**

Additional Comments:

Did this course help you meet the learning goals of your academic career?

Yes **No**

Please explain:

What did you find most valuable about your experience this semester?

If you had the opportunity, would you work in a group with these peers again?

Yes **No**

Please explain:

In the space below, write each team members name and rate them with a score of 1 to 5 (1 lowest and 5 having completed the right amount of work) in relationship to the work they added to this project.

Add any additional comments.

Additional Comments:

7. Appendix C

Business Evaluation (Use this evaluation if the group chose to work with a local business.)

Advanced E-Commerce and Web Production Project

Business or Organization - Evaluation Form
Semester and Year

Community Business or Organization: _____

Contact Name: _____ Date of evaluation: _____

Please select the appropriate response:

1. Overall, our experience with this group of students was:

Excellent **Good** **Fair** **Poor**

Comments: _____

2. We want to continue to have students work with our business or organization.

Strongly Agree Agree Disagree Strongly Disagree

Comments: _____

3. Overall, we are satisfied with service provided by the students.

Strongly Agree Agree Disagree Strongly Disagree

Comments: _____

Evaluation of student(s)

What grade would you give each student (scale of 0-100)?

List any specific comments you would like to make about each student.

Name _____

Name _____

Name _____
