AN ONLINE EVALUATION OF THE COMPETE ONLINE DECISION ENTRY SYSTEM (CODES)

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ABSTRACT

The primary purpose of this paper is to present the results of an online survey of the effectiveness of the COMPETE Online Decision Entry System (CODES), which was deployed on the Web in Fall 1999. A brief ASP-based CODES Evaluation Survey was developed and deployed on the Web to assess whether CODES was convenient and easy to use, whether decision entry and viewing and printing output were simple, and whether the decision entry page layout was easy to follow. In addition, respondents were asked whether they preferred to print one or more pages of results at a time, and whether they encountered any difficulty logging in to CODES. The results of the survey and suggestions for improvement are presented, and future improvements are discussed.

INTRODUCTION

The primary purpose of this paper is to present the results of an online survey of the effectiveness of the COMPETE Online Decision Entry System (CODES) (Palia, Mak and Roussos, 2000). CODES is a new world wide web-based simulation interface that enables competing participant teams in the marketing simulation COMPETE (Faria, Nulsen and Roussos, 1994) that have Internet access, to register their teams, enter and submit their decisions, and subsequently to retrieve and print out their results from a remote site (Palia, Mak and Roussos, 2000).

First, user-centered learning is discussed in the context of the advent of the Internet. Next, the structure of CODES is revealed. Later, the CODES Online Evaluation Survey is discussed. Then, the results of the survey and suggestions for improvement are presented. Finally, future improvements are discussed.

The advent of the Internet has led to an explosive growth in global networking. These global networks extend student-teacher relationships and overcome the space/time limitations of brick-and-mortar classrooms. With the advent of the World Wide Web, these networks challenge and/or redefine student-teacher interaction in the new millennium.

The World Wide Web, a distributed database that rides on the Internet, has unique characteristics as an instructional medium. The web can be used to reach geographically dispersed audiences with consistent content. Participants can access materials anytime, anywhere, provided they have Internet access. Accurate and up-to-date information can be delivered using hypermedia via various computing platforms (such as Windows, Mac, and Unix).

Hypermedia serves as a natural and efficient platform for information retrieval (Dimitroff & Wolfram, 1995). In some instances the Internet has been used as a platform for the delivery of lecture notes (in the form of PowerPoint files), lecture outlines, and provision of general information, absent any instructional framework. In other cases, participants/students have been able to access and download pc-based marketing decision support systems and graphics decision support packages. Recently, participants/students have been provided access to and use of dynamic online models for analysis and learning. Hypermedia characteristics are better suited to the constructivist design for user-centered learning.

Constructivism is a cognitive perspective of learning which focuses on mental behavior, and which has profound implications for teaching and research methodology. According to the cognitive views of learning, the "….active work of mental behavior turns information into useful knowledge." (Grabe & Grabe, 1998). Constructivism has a rich history in philosophy, psychology, and education (Mahoney, 1991).

There are significant differences between the cognitive constructivist perspective and the behavioral perspective with regard to basic assumptions about knowledge, knowing and learning. Cognitive constructivists believe that knowledge is active, situated in lived worlds. Individuals construct knowledge. Meaningful knowledge is useful and retained, building on what the learner already knows. The teacher's role is coach, mediator and strategic. In contrast, the behavioral perspective assumes that knowledge is inert. Individuals are passive recipients of knowledge. Learning occurs with programmatic, repeated activities. The teacher is authoritative and directive. Constructivists believe that what a person knows is actively constructed. Learning serves an adaptive function; its role is to help the individual operate within his or her personal

world; thus learning is not the storage of "truths," but of useful personal knowledge.

Constructivists share common beliefs about ways of knowing. First, "constructivist knowing assumes the active and proactive nature of all perception, learning and knowledge….." (Mahoney, 1991). Next, "prior knowledge and experience is the springboard for useful, personal knowledge construction….." Third, "constructivist learning experiences and appropriate classroom practices include reflective thinking and productivity; authentic activities, including student collaboration and consideration of multiple perspectives, and student access to content area experts who can model domain-specific skills…." (Grabe & Grabe, 1998). In addition, "constructivist-oriented teachers mediate between student prior knowledge and their lived worlds, creating learning environments that will help them develop increasingly complex understandings and skills.

Constructivist theory postulates that people learn best by actively constructing their own understanding. As such, learners are presented with opportunities to build on prior knowledge and understanding (Bruner, 1960). Based on the augmented knowledge and understanding, learners construct new knowledge and understanding from authentic experience. Furthermore, learners are allowed to confront problems full of meaning because of their real-life context. In solving these problems, learners are encouraged to explore possibilities, invent alternative solutions, collaborate with others learners (or external experts), try out ideas and hypotheses, revise their thinking, and finally present the best solution they can derive (Novak, 1998).

Proponents of the constructivist design for user-centered learning emphasize the importance of providing students with tools to retrieve, record and analyze information, instead of providing specific instructions (Cunningham, D.J. et al, 1993). The provision of such tools serves as an integral part of the constructivist design.

The COMPETE Online Decision Entry System (CODES) facilitates and provides an enriching learning experience for the user. CODES leverages on the unique characteristics of the Internet and provides online utilities for the participants to capture, retrieve and analyze information. These utilities and online materials change and evolve over time. The plasticity of the Internet is ideally suited to ongoing changes, updates and revisions. With these revisions, CODES marks a significant step by the COMPETE team to continually improve the quality of service delivery to the user. The COMPETE team seeks an incremental and progressive transition from the DOS-based COMPETE data input to a web-based data capture and dissemination system, coupled with facilities for analysis and visualization.

INTERACTIVE DYNAMIC CONTENT

The World Wide Web is used to share text documents around the world. These documents are static since the user (client) that requests them does not have any ability to interact with the content delivered by the web server. This static approach is still evident in many web pages that display information, corporate profiles, or online reference material that do not change frequently.

In recent years, the nature of the World Wide Web has changed with the advent of dynamic content. Over the years, the web has progressed from delivering static web pages to delivering dynamically generated pages via database driven applications using logic executed on the web server.

The term dynamic refers to the process of creating HTML content that depends on the information that is sent or submitted to the web server. The web server processes the requesting information and converts the output into HTML. Dynamic content is well illustrated on the Federal Express website (http://www.fedex.com). The use of dynamic content precludes the need for repeated visits to the Webpage design editor in order to change content.

CODES was developed using Active Server Pages (ASP), a compile-free programming environment that allows the combinations of HTML, scripting and components to create powerful interactive and dynamic Internet applications that run on Microsoft Windows NT/Internet Information Server (IIS) web server (IIS, 1999). In addition, ASP has standard server components known as ActiveX Database Objects (ADO) that provide a programmable communication mechanism to connect and manipulate databases (IIS, 1999). These components enable development of ASP templates (which are basically scripts or text files) that populate the final web pages on the fly with data from databases (Walter, 1998).

CODES EVALUATION SURVEY

CODES was deployed on the Web in Fall 1999. Subsequently, a brief ASP-based CODES Evaluation Survey was developed and deployed on the Web to assess whether it was convenient and easy to use, whether decision entry and viewing and printing output were simple, and whether the decision entry page layout was easy to follow. In addition, respondents were asked whether they preferred to print one or more pages of results at a time, and whether they encountered any difficulty logging in to CODES. Finally, respondents were requested to specify features they would like to see included, and to suggest improvements. A five-point Likert scale (1=strongly agree, 2=agree, 3=neutral, 4=disagree, 5=strongly disagree) was used for each of the first six questions.

A hyperlink to the CODES Evaluation Survey was provided on the course website homepages, and participants were requested to complete the survey based on their experience with the use of CODES. Twenty valid

responses were received within two weeks. The survey results are provided below.

The summary of results indicates that the mean score was greater than 2=agree for questions 3 and 4. This suggests that respondents agreed on the average (mean=2.15) that viewing output was simple, but disagreed on the average (mean =3.35) that printing output was simple.

Eighteen of the 20 respondents either "strongly agreed" or "agreed" that CODES is easy to use, 17 of the 20 respondents that decision entry is simple, 14 of 20 respondents that viewing output is simple, only 5 out of 20 respondents that printing output is simple, 17 out of 20 respondents that CODES is convenient to use, and 17 out of 20 respondents that the Decision Entry layout page is easy to follow.

Thirteen of the 20 respondents preferred to print all results pages at one time, while the remaining 7 respondents preferred to print both one page of results at a time or all results pages at one time. Only one respondent experienced difficulty logging in to CODES. This was a result of the hyperlink being changed or the web server downtime.

Additional CODES features suggested included provision of visual graphic output, totals for advertising expenses, and communications tools and e-mail notification of results. In addition, respondents provided several suggestions for improvement. First, they suggested that results for different periods be presented on screen for comparison purposes. Next, they suggested that paper be conserved by reformatting printouts. In addition, they suggested that participants be given the ability to input company's name, brand name, etc. on the Web. Further, they suggested that the entry form be shortened or split up into several pages, that color be used to differentiate the blocks, that more meaningful web page titles be provided and that the user be enabled to select the period for which decisions are to be entered. Next, they suggested that they be provided with the ability to download the results and to import the results into EXCEL for subsequent analysis. Finally, they suggested that a summary of the decisions entered be provided for checking data entry. Many of these suggestions have since been implemented.

FUTURE IMPROVEMENTS

Currently, competing participant teams can only view and print the output file from the Web browser. A provision can be made for the competing teams to download the output file so that the data can be directly input and used in spreadsheet or database analyses.

In addition, the output can be presented in a more informative manner with the use of dynamic graphical generation technologies. Based on the data in the output file, the system will be able to create appropriate charts or graphs, and incorporate necessary statistical features for analysis.

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SUMMARY OF RESULTS

	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8
N	20	20	20	20	20	20	20	20
Mean	1.80	1.85	2.15	3.35	1.75	1.95	2.35	1.95
Median	2.00	2.00	2.00	3.50	1.50	2.00	2.00	2.00
Mode	2	2	1	4	1	2	2	2
Standard Deviation	.62	.81	1.18	1.27	.97	.89	.49	.22
Range	2	3	4	4	3	3	1	1
Minimum	1	1	1	1	1	1	2	1
Maximum	3	4	5	5	4	4	3	2

For Q1 to Q6, the scale used is
1=Strongly Agree 2=Agree 3=Neutral 4=Disagree 5=Strongly Disagree

QUESTIONS

Q 1: CODES is easy to use.
Q 2: Decision entry is simple.
Q 3: Viewing output is simple.
Q 4: Printing output is simple.
Q 5: CODES is convenient to use.
Q 6: The Decision Entry page layout is easy to follow.
Q 7: I prefer to print
      a.   One page of results at a time.
      b.   All result pages at one time.
      c.   Both a and b above.
      d.   Neither a nor b above. I don't print at all.
Q 8: Have you encountered any difficulty logging in to CODES?
      1=Yes
      2=No
Comment: Difficulty experienced when hyperlink was changed or server was down.

Q10: What other CODES features would you like to see included?

- Provide visual graphic output.
- Provide totals for advertising expenses.
- Provide communication tools and e-mail notification of results.

Q11: Please suggest improvements to CODES.
- Present results for different period on screen for comparison purposes.
- Printing results spills over to 2 pages and results in a waste of paper.
- Ability to input company's name, brand name, etc. on the web.
- Entry form is relatively long.
- Use color to differentiate the blocks.
- Ability to download results.
- Ability to enter exact values instead of "0" as place markers.
- Provide more meaningful web page titles.
- Enable use to select the period for which decisions are to be entered.
- Provide a summary page of decisions entered for checking data entry.

Q12: Other comments.
- Provide ability to import results into EXCEL.
- Post conclusion on the web site.