Beyond Entertainment: Using Interactive Games in Web-Based Instruction

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Interactive games on the Web are not just for fun. With the wide acceptance of the Internet and the arrival of multimedia browser plug-ins, many training publishers are now using Web-based games as a powerful way to engage, simulate, educate, and assess. This paper discusses basic elements of game design, the purpose of using games in courseware, the unique advantages of Web instructional gaming, and possible pitfalls.

INTRODUCTION

Computer-aided training, now particularly via the World Wide Web, plays an important role in the trends in training and development. Furthermore, interactive games can be a powerful motivating element in interactive multimedia learning environments. Understanding basic elements of game design as well as potential pitfalls in their introduction can make their use more effective. The purpose of this paper is to reflect the author's industry perspective on game development for the World Wide Web.

WHY WEB GAMES NOW?

There is no doubt that the World Wide Web of the Internet has exploded in popularity over the past few years. The trainer's dream of on-demand, distance learning has overcome a major infrastructure hurdle with the wide acceptance of the TCP/IP (Transmission Control Protocol/Internet Protocol) and HTML (Hypertext Markup Language) standards across all disciplines. The pipeline exists and is viable. Simple text-based information, including hyperlinked Web pages and electronic mail, has been zipping across the wires for years. Images and sound add more dimension to the interactive experience.

However, with the introduction of multimedia browser plug-ins such as Macromedia's Shockwave, rapid development, publishing, and accessibility of fully interactive, networked multimedia content is a reality. The days of developing interactive communications within cumbersome proprietary systems to be delivered on a single company's closed wide area network to constraining, unsupportable desktop computer configurations are over.

Interactive games are only one part of this explosion. Games can be effective instructional tools that entertain while motivating.

BASIC ELEMENTS OF GAME DESIGN

Interactive games possess common elements that appear in varying degrees. It is often beneficial for game designers to begin critiquing their work by analyzing the existence of the following elements.

- Entertainment: The differentiating factor between games and simulation is entertainment. Whereas many games tend to simulate reality, it is entertainment (and humor in particular) that sets gaming apart from simply simulation. It is the entertainment factor that initially attracts students to games, and hopefully continues to motivate one to learn.

- Fantasy: The fantasy element within games can range from a realistic simulation of real life to non-existent worlds.

- Non-threatening reality: It is the lack of threat within a game that prompts users to take paths they might not normally pursue. It is much easier to take a financial gamble or risk death in a gaming environment than in real life.

- Objective: All games have an objective or goal to be reached. The objective might be high scoring, solving a puzzle, or reaching a goal within a certain time.

- Rules: The world in which the game exists has its own set of rules. Sometimes the rules are stated, other times the user must find out by playing a number of times what constraints exist. Rules can also change during game play; for example, adding or subtracting constraints based upon the current knowledge or acquired tools.

- Opposition: Some kind of opposition usually exists, in the form of an enemy within the game world, or a race against time, or against oneself in an effort to beat a previous score, or a combination of several of these.

- Hazards: Hazards challenge the game player. Much like rules, the student must learn what the challenges are to the game each time he plays.

- Outcomes: If an objective is met or not, some outcome occurs, such as a high score, saving the planet, or moving onto the next level. The most important outcome in games that train is learning.

WHY USE GAMES IN COURSEWARE

Computer-based games for instruction gained wide popularity in schools for their ability to motivate. The goal of instructional games is of course to teach, but many teachers found computer games a powerful motivator for initiating the learning process. The same holds true for interactive computer games within the corporate environment.

Focus on the goal of the game is also an important factor. When games were introduced in classroom situations, some students were more focused because they had an alternative learning mechanism to the instructor.

Several secondary factors can also be gleaned from gaming within computer-based instruction, such as rules of right and wrong, the existence of chance in the world, and increased comfort with the computer.

POTENTIAL PITFALLS IN GAME DESIGN FOR INSTRUCTION

Games should not be used simply because they are games. The goal is to maintain the student's interest while increasing his skills and knowledge. Games that are too easy will be dismissed quickly. Since learning occurs with repetition, a trainer wants a student to be motivated to come back to the game often.

Game scenarios and rules must also be introduced properly in order to hold the student's attention and understanding.

A game should also loosely match the tone of the rest of the training program. Whereas a game is a unique area to introduce humor and entertainment, the game should not jolt the student. For example, a game that relies heavily on humor within a somber subject matter should be rethought.

The outcome when a student loses a game should be treated with more importance than when winning. Demoralizing results can lead to humiliation and lack of motivation.

With all Web-delivered information, reducing latency is critical. Motivation can decrease quickly if a student is waiting for a game to react or more information to download. Quick response from the game is crucial. With the volatile nature of the Web, however, some of this will certainly occur.

UNIQUE ADVANTAGES OF WEB-BASED INSTRUCTIONAL GAMING

Dynamic characteristics of gaming software coupled with the ubiquitous connectivity of the Internet make Web-based instructional games uniquely positioned to enhance computer based training:

- Asynchronous learning opportunities: Geographically dispersed student populations do not have to wait for a training class because of the distant, on-demand nature of Web training and games in particular.

- Process data gathering: Administrative databases running behind the scenes can quickly collect data on how students react to games and their success in order to identify learning patterns. Games on the Web allow ubiquitous and efficient data collection, analysis, and reporting.

- Real-time interaction across a geographically dispersed population: Multiplayer games have the added benefit of actually playing another person instead of simply a machine.

- Dynamic/changing scenario characteristics: The scenario of a game can also evolve over time to simulate real occurrences such as the stock market, species extinction, or population growth.

CONCLUSION

Games that train are not a new concept. From the introduction of computer-based training, instructional designers have incorporated everything from simple gaming elements to full-fledged games that are the entirety of the training module.

However, with the recent push to deliver on-demand training resources via the Web coupled with the release of simpler authoring systems for the network, it has become easier to develop interactive games within training programs.

If developed and implemented properly, interactive Web games can be a powerful motivator within training programs.

EXAMPLES

Up to the minute links to Web-based example games demonstrated during this session can be found at http://www.neworder.com/kelly/webgames.

REFERENCES

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About the Author

A graduate of Vanderbilt University, Kelly Michael Stewart has consulted for companies such as Apple Computer, Johnson & Johnson, Nissan, Deloitte & Touche, and Maybelline. He was also a member of the Saturn training and development team when the historic first car rolled off the production line. Stewart's experience includes project management, interface design, classroom software training, consulting, writing scripts, and programming.

As NewOrder Media's Director of Interactive Development, he manages the company's creative production team, researches new methods of information delivery, alpha and beta tests several multimedia software products, and evaluates technology and communication trends.

Stewart is a frequent speaker at worldwide industry events including the Macromedia International User Conference, MACWORLD, Internet World, and ASTD. He has been a contributor to several books including *Macromedia Shockwave for Director - The Complete Resource* and *The Electronic Marketing Handbook*, and industry honors include being named Macromedia Mogul of the Month.

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