



Play-Centric Games Education

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The interactive media program at the USC School of Cinema-Television combines a broad liberal arts education with the technical expertise needed to create games that provide players with a narratively rich and emotionally immersive experience.

In the past few decades, interactive entertainment has grown to rival Hollywood in both market size and cultural impact. Game industry revenue has increased at double-digit rates for years and recently eclipsed domestic theatrical box office receipts. Studies indicate that 90 percent of US households with children have rented or owned a videogame or computer game,¹ and that young people in the US spend an average of 20 minutes per day playing videogames.² Digital games are now the second most popular form of entertainment after television.

The extraordinary imagery in today's games, which is comparable to that found in film and TV, coupled with its increasing complexity and realism, have broadened the appeal of electronic entertainment to include adults as well as adolescents and children. To fully realize the expressive potential of these sophisticated platforms and satisfy the demand for more challenging and immersive gaming experiences, the industry is looking to the next generation of designers and visual storytellers.

Similar to the explosion of interest in screenwriting and directing that accompanied the growth of the film and TV industries, many creative thinkers today see interactive entertainment as the most innovative and culturally pertinent mode of expression available to them. Skyrocketing sales of videogames and computer games have likewise spurred interest in game design as a career path.

GAMES EDUCATION TODAY

Major universities around the world now offer degree programs in game design in response to student demand;

more than 80 such programs exist in North America alone. Recognizing the overwhelming interest in guidelines for teaching game design, the International Game Developers Association (www.igda.org) established a committee to help educators craft a curriculum that reflects the real-world creative process of professional game designers. The "IGDA Curriculum Framework" sidebar describes this committee's efforts.

Unfortunately, many of today's programs exclusively address the technical aspects of game design. Such programs effectively prepare students for entry-level positions in the game industry, such as a 3D animator, but, by depriving them of a broad liberal arts education, do not encourage the kind of critical thinking necessary to transcend existing boundaries of content and expression. Nor does a tools-focused curriculum offer a rigorous exploration of history, theory, and practice as is typically found in the study of film, music, architecture, theater, and other arts.

Skeptics may question whether game design should be taught beside more established disciplines. However, games predate computer science, and, as cultural historian Johan Huizinga asserts, play may in fact predate culture itself,³ making game design one of the oldest arts rather than the newest. In addition, while film programs abound on college campuses today, similar doubts were raised about studying the "flickers" in the industry's early days.

In *Hamlet on the Holodeck: The Future of the Narrative in Cyberspace*, Janet Murray, an internationally recognized digital media theorist, points to a future in which games enjoy the same level of prestige currently

IGDA Curriculum Framework

Today's game industry is filled with people who care passionately about the future of their medium. Many of them belong to the International Game Developers Association, which has formed several committees to focus on issues important to the industry, including diversity, business practices, quality of life, and education.

The industry recognizes that digital games have changed dramatically over the past 30 years and will likely continue to evolve. Next-generation game developers will need very different skills than previous designers to lead that process wisely and effectively.

In an effort to shift games education away from the existing trade school model to a more comprehensive, humanistic approach, the IGDA education committee spent three years exploring the needs of publishers, developers, students, and academic institutions to develop its Curriculum Framework (www.igda.org/academia/curriculum_framework.php).

Comprised of more than 50 professional games educators and industry veterans from around the world, the committee espouses an expansive and forward-thinking template for games education that includes numerous core topics.

Critical game studies: Analysis and history of electronic and nonelectronic games. The primary goal of this topic is to develop and refine a vocabulary for articulating game aesthetics, including the distinctive features unique to games as well as those shared with other forms of media and culture.

Games and society: Understanding how games reflect and construct individuals and groups. This topic offers key sociological, anthropological, cultural, and psychological insights into worldwide gaming culture. It includes scholarly work on online economies and community building, fan cultures and their creative reworkings of game content, the role of play in human culture, and the relationship between online and offline identity.

Game design: Principles and methodologies behind the rules and play of games. This topic addresses fundamental concepts behind the design of electronic and nonelectronic games. It is a detailed study of how games function to create experiences, including rule design, play mechanics, game balancing, social game interaction, and the integration of visual, audio, tactile, and textual elements into the total game experience.

Game programming: Aspects of traditional computer science modified to address the technical aspects of gaming. This topic includes mathematics, programming techniques, algorithm design, game-specific programming, and the technical aspects of game testing, much of which could be taught under the auspices of a traditional computer science curriculum. However, games present specific programming challenges

that require working within cross-disciplinary teams and understanding aesthetic goals not traditionally covered in such courses.

Visual design: Designing, creating, and analyzing the visual components of games. This topic includes visual design fundamentals across a broad range of media. Content areas include history, analysis, and production of traditional art media as well as other design disciplines including architecture and industrial design and time-based media like animation, and filmmaking. Special emphasis is on how visual aesthetics play a role in the player's experience of the game.

Audio design: Designing and creating sound and sound environments. This topic includes various theoretical and practical audio-related areas such as recording studio skills, sound editing and mixing, electronic sound generation, sound environment creation, music theory and history, and music composition. Special emphasis is on the role of the audio experience within the larger context of a game. As with visual design, this topic focuses on design fundamentals rather than on specific technical knowledge.

Interactive storytelling: Traditional storytelling and the challenges of interactive narrative. Writers and designers of interactive works need a solid understanding of traditional narrative theory, character development, plot, dialogue, backstory, and world creation as well as experimental approaches to storytelling in literature, theater, and film that have relevance to games. In addition, interactive storytelling requires familiarity with new tools and techniques, including the technical aspects of writing for this new medium, algorithmic storytelling, and collaborative story construction.

Game production: Practical challenges of managing game development. Games are among the most complex forms of software, and game development and publishing are intricate collaborative efforts. Along with the technical challenges, this topic addresses issues of design documentation, content creation, team roles, group dynamics, risk assessment, people management, and process management.

Business of gaming: Economic, legal, and policy aspects of games. This topic examines the ways games are funded, marketed, and sold and the relationships among publishers, developers, distributors, marketers, and retailers. Market and industry trends, licensing management, the dynamics of company and product value, and business differences between major game platforms are all important aspects of the business of gaming.

While the IGDA education committee acknowledges that no single program can effectively address each and every core topic within the Curriculum Framework, the members agree that these are all essential to a well-rounded games education.

accorded cinema.⁴ "Every age," she writes, "seeks out the appropriate medium in which to confront the unanswerable questions of human existence." Murray imag-

ines a "great procedural virtuoso" capable of using the intrinsic properties of digital media to evoke experiences that a book or film cannot capture in the same way.

By offering a formal, well-designed games education program, academic institutions can help create this new breed of designer.

USC INTERACTIVE ENTERTAINMENT PROGRAM

Several years ago, the University of Southern California School of Cinema-Television (www-cntv.usc.edu) introduced a master of fine arts program in interactive media designed to prepare the next generation of visual communicators for the coming decades' challenges. This highly successful program has clearly shown that, despite technological differences in old and new media, many similarities exist and that all students benefit from cross-disciplinary collaboration.

With a multimillion-dollar endowment from games publisher Electronic Arts, the school has established a new interactive entertainment program leading to a bachelor of arts degree that combines humanities courses with specialized classes in the history, theory, and practice of creating games and other forms of interactive entertainment.

The BA program's proximity to the MFA program and research labs as well as to the USC Viterbi School of Engineering provides a unique opportunity to integrate game design, the creative processes of traditional media, and the technical skills of computer science at the undergraduate level.

Program goals

The new program aims to impart an understanding of the essential properties of an effective and entertaining interactive experience as well as to teach the necessary technical skills to envision, design, and produce such experiences. In addition, students learn to work effectively in teams, as Figure 1 shows. They also have the opportunity to explore new forms of interactivity and to imagine the future of games and interactive entertainment.

Closely following the IGDA Curriculum Framework, and building on the solid foundation of existing media courses at the School of Cinema-Television, the program provides students with

- extensive knowledge of the history of games and interactive entertainment, game genres, seminal works, and the significance of various landmarks in the evolution of interactive entertainment;
- an aesthetic vocabulary for understanding and analyzing games and their formal, dramatic, and dynamic elements;
- a cultural perspective on games and their place in human societies and groups, both historical and current;

- analytical, creative writing, and critical thinking skills to clearly envision and articulate ideas for interactive experiences;
- an understanding of visual communication, traditional storytelling, narrative structures, character development, and cinematography and their relationship to interactivity and participatory design;
- hands-on experience in game play design, prototyping, play testing, and the iterative design process that results in successful interactive products;
- an understanding of game theory, play mechanics, participatory design, interactivity, motivation, meaningful choice, and user engagement;
- exposure to leading publishers, developers, and designers as well as industry trends;
- artistic skills in digital imaging, interface design, animation, and using 2D and 3D tools;
- an understanding of the interactive entertainment industry and business skills required to be an effective creator;
- technological skills in programming for interactivity, human-computer interfaces, game logic, and implementation;
- exposure to emerging ideas in game design, including independent game development, art games, and educational games; and
- production and collaboration skills in interdisciplinary environments.

Every member of a
game development team
can be a vital voice
in the design process.

The program places a premium on game design. In his "An Academic's Field Guide to Electronic Arts," Carnegie Mellon University's Randy Pausch observes that "thinking the only person who works at EA is the lead game designer"⁵ is a common misconception. This is true; however, every member of a game development team can be a vital voice in the design process. Teams whose members all have a deep understanding of design, especially realized through firsthand experience, produce superior products. Students interested in the theoretical or cultural aspects of game studies similarly benefit from assuming the designer's role and learning the underlying mechanics of games and how designs evolve.

Play-centric design

The interactive entertainment program's emphasis on *play-centric design* puts player experience at the heart of the design process to create deeper audience involvement, richer characters, more complex stories, and more meaningful interactions.

In a nutshell, games are formal systems of rules that define and restrict player actions and objectives as well as immersive experiences in which players often assume the role of some character in a story. Games thus exhibit

dynamic, emergent properties that can be tuned to create specific sensations and types of interactions.

The game designer creates the rules of play, thinks up the dramatic premise, and works with the development team to create a compelling player experience. Ultimately, however, neither the designer nor any other team member is the best judge of whether a game “works.” Student designers are especially prone to regard functionally sound creations as successful. As any experienced game developer can tell you, the public is much harsher than that.

For this reason, the interactive entertainment program stresses rigorous playtesting. Students use paper prototypes, storyboards, and simple software mock-ups at the earliest stages of a project and continue to playtest and revise their system to ensure that play is engaging before expending time and money on secondary components. This iterative process enables students to efficiently evolve original concepts into sophisticated software products.

The principles of play-centric design can be applied to all kinds of games and simulations including computer games, console games, online games, and mobile games. While this approach may sound like common sense, it is not widely practiced by the game industry. On the contrary, industry teams tend to start with an established game play model and produce variations of it year after year.

Coursework

Students in the interactive entertainment program enroll in the USC College of Letters, Arts, and Sciences, where they take their preprofessional courses and fulfill their general education requirements, and select major courses from the curriculum of the School of Cinema-Television. The “Interactive Entertainment Courses” sidebar summarizes the program’s required classes, advanced project electives, and some core topic electives.

The introductory games design course, Game Design Workshop, adheres to the IGDA Curriculum Framework, although it predates the framework by many years. First developed in 1996, the course is one of the earliest of its kind to go beyond tools education and examine the nature of games, the process of design, and the aesthetics of play. Drawing on work from fields as disparate as industrial design, psychology, anthropology, sociology, mathematics, and economics, it treats



Figure 1. USC’s interactive entertainment program stresses team building and sophisticated cross-disciplinary project development.

game design as a participatory art form rather than a technical practice. This course pioneered player-centric design, including the use of paper prototypes and continuous testing with player feedback.

More than 300 students have taken the class since its inception. Many who have gone on to work in the game industry regard it as one of the most important courses they took in preparing for their career. Similar to the entry-level filmmaking courses in the School of Cinema-Television, the Game Design Workshop provides a solid basis for personal expression as well as collaborative work within large teams.

In the introductory game programming course, Programming for Interactivity, students with various levels of expertise—including complete lack of programming experience—explore the mechanics, aesthetics, and terminology of game-related virtual environments. Students become familiar with object-oriented programming and complete several game prototypes by semester’s end. Like the complementary film technology and techniques classes taught in the School of Cinema-Television, this course teaches technology in support of the artistic vision.

Intermediate and advanced classes involving large student teams likewise combine design and technology in service of the player experience. Current projects include *Dyadin*, a cooperative action puzzle game selected as a Student Showcase Winner in the 2005 Independent Games Festival (www.igf.com/finalistsandwinners.htm), and *Cloud*, a unique and peaceful flying game featured in the 2006 Slamdance Guerilla Gamemaker Competition (www.slamdance.com/games) shown in Figure 2.

Interactive Entertainment Courses

The interactive entertainment program at the USC School of Cinema-Television includes required classes, advanced project electives, and core topic electives.

Required Classes

The following classes are required of all majors and teach a range of skills in artistic expression, technology, collaborative practice, and aesthetic appreciation.

Introduction to Interactive Entertainment. This class exposes students to seminal games and provides them with the critical vocabulary and historical perspective to analyze their own experiences with interactive entertainment as well as to imagine and articulate original ideas for such experiences.

Introduction to Cinema. This lecture course covers cinematic techniques, aesthetics, criticism, and the social implications of cinema accompanied by screenings of appropriate films.

Fundamentals of Film. This class explores production techniques and equipment, areas of film research, idea and vocabulary development, and communication using images and sound.

Visual Communication. This production-intensive course explores film expression, aesthetics, criticism, and ethics through five individual film projects.

Game Design Workshop. Students generally take this class in their second semester after entering the program. In this class they design, prototype, and play test several original games and learn the fundamentals of game design. Games are designed in teams of two and play tested in class with peer critique.

Programming for Interactivity. This course introduces programming techniques and languages as they relate to games. Students use their knowledge to create playable digital games, with assignments geared to their programming expertise.

Intermediate Game Design. This class introduces students to more advanced concepts in game design and production such as ideation, game engines, digital prototyping, user testing, interface design, level design, quality assurance, and presentation skills. Working together in teams, students

produce several prototypes and one complete digital game system by semester's end.

Intermediate Game Development. Taken in conjunction with Intermediate Game Design, this course teaches students the advanced programming skills they need to implement their own complete system.

Advanced Project Electives

Students must complete one of the following courses, which require significant depth and scope in game design.

Advanced Game Project. Students produce a digital game suitable for Web distribution or submission to an independent game design competition. Taught in conjunction with the USC Viterbi School of Engineering, this course requires students to assume specialized roles in project management, game design, programming, visual design, and sound design as members of a large project team.

Game Industry Workshop. In this class, a team of advanced students explores a game play research question using professional tools while mentored by industry experts. For example, this class has produced mini-expansion sets for EA's *The Sims 2* using internal editing tools provided by the company.

Experimental Game Topics. This course investigates one topic in experimental game design. Topics vary by semester—for example, students might focus on emergent game play in one semester and custom-made physical interfaces in another.

Core Topic Electives

The following is a sample of elective courses at the School of Cinema-Television that cover the range of core topics in the IGDA Curriculum Framework. Students in the interactive entertainment program can specialize in a particular area, such as visual design, or take a variety of courses.

Character Development and Storytelling for Games. In this class, students explore classic dramaturgical elements—characterization, motivation, story patterns, structures, styles, genres, and so on—and learn how to use these

Both projects epitomize the concept of play-centric design.

DEVELOPING SUCCESSFUL GAME CURRICULA

In developing the interactive entertainment program, the School of Cinema-Television has had the advantage of drawing on inspiration from the highly successful film school model as well as more than a decade of trial and error in implementing game design courses. Other academic institutions interested in creating a similar program that melds artistic expression, technological expertise, aesthetic appreciation, and col-

laborative practice can benefit from the lessons learned at USC.

Keep design at the heart of the program

Design connotes intention—the articulation of an idea within a medium of expression. Those who wish to be literate in game studies must understand the formal, dramatic, and dynamic elements that make up a game. They must also appreciate the important place of games in society and in people's lives. Tools and technologies come and go, but game mechanics can exist for thousands of years, appearing in new contexts, serving new

to create emotionally rich characters and worlds for interactive entertainment.

Interface Design for Games. This course introduces students to the aesthetics, terminology, and common trends of game interface design. Topics include fundamentals of color theory, image editing, 2D and 3D spaces, animation, still and motion compositing, user/camera perspective, diegetic and nondiegetic representation, and sound incorporation.

3D Animation and Character Design. This course teaches students the principles of 3D animation and character design for games. The class combines lectures covering aesthetic concepts and techniques with tutorials and exercises to demonstrate the use of 3D animation software.

Advanced Visual Design for Games. This class considers a larger scope of visual game design, including the role of characters, architecture, indoor and outdoor spaces, and environmental effects and sounds.

Usability Testing for Games. This course addresses concepts and methods of usability assessment, with emphasis on game interfaces and translating ideas into design recommendations. Topics covered include identifying and describing user needs and requirements, user-centered design, and evaluating information systems.

Design and Technology for Mobile Experiences. This class explores the design challenges and opportunities presented by mobile technologies. Students form groups to develop a mobile project design using the principles from readings and class discussions.

Sound Design for Games. This course introduces students to the techniques, terminology, and implementation of sound in games. Topics include the role of sound in supplementing or creating an emotional experience, cueing the player, establishing a sense of place, and concepts of realistic sound.

Introduction to Computer Animation. In this class, students learn the fundamentals of computer animation including geometric modeling, motion specification, lighting, texture mapping, rendering, compositing, production techniques, and computer-synthesized animation systems.

Business and Management of Games. This course prepares students for successful careers in interactive entertainment. It covers a wide range of issues including current business models in games and interactive media, methods for pitching and getting products funded, copyright and intellectual property issues, production management techniques, and start-ups for aspiring entrepreneurs.

Critical Theory and Analysis of Games. This class explores the formal, aesthetic, and cultural aspects of digital games, the emerging critical discourse on meaningful game play, and the relationship of digital games to other media such as film and TV.

Anatomy of a Game. This seminar introduces students to each of the professional disciplines involved in making digital games. The class covers two different game products from concept to delivery—for example, EA's real-time strategy game *The Lord of the Rings: The Battle for Middle-Earth* in the first half of the semester and Sony's adventure game *Jak and Daxter 3* in the second half.

Game Studies Seminar. This is a topic class that addresses various game studies issues from semester to semester—for example, in one semester students might focus on the cultural, ethical, and political complexities of real-war-based videogames, while in another semester the topic might be experimental games.

Multiplayer Game Design. In this course, students learn the basic elements of multiplayer game design from both formal and sociological perspectives, as well as how to conceptualize and design a multiplayer game with innovative community features. The class covers the history and core concepts of multiplayer games—including sports games, table games, game shows, game worlds, first-person shooters, and Web games—and brings these concepts to life through play, critique, and industry expert visits.

Advanced Game Development. This class covers advanced concepts in 3D game development. Students have access to a fully integrated game development package combining an “available source” game engine and artificial intelligence middleware.

purposes, and creating new experiences for generations of players.

Specialization is both an imperative and an impediment

Given the extraordinary range of skills required to make games today, a student cannot possibly learn every aspect of game design and production. Over time, students naturally gravitate to specialties that most interest them. Unfortunately, game development team members tend to view projects through the narrow lens of their own expertise and lose sight of the ultimate goal—a rich

and rewarding player experience. Educators should strive to create bridges between specialties.

Don't design a program for any one employer

Fundamental skills translate across the industry, of course, but company cultures vary widely. To assume that a small developer, or a different publisher, would have the same culture as EA, for example, is shortsighted. However, the ability to work efficiently to schedule, and to be both creative and conscious of how your decisions affect others, are important skills no matter where you find employment.



Figure 2. A 2006 Slamdance Guerilla Gamemaker Competition winner, *Cloud* epitomizes play-centric design at USC.

Foster a culture of passionate exploration and innovation

A good games education program has an energy that everyone involved can sense. On a typical weekend night at the USC game lab, it is common to see student teams hard at work on a project, their whiteboards covered in code and voices raised in heated debate. Numerous factors contribute to such an environment, but having a core group of instructors who are passionate about games and accessible to students is critical.

Look for success and acknowledge it

The School of Cinema-Television is famous for its “mafia” of graduates who help one another get a leg up in the highly competitive film industry, and a similar network has emerged in the games program. Students who get an internship or a job upon graduation share their experiences with the school and let other students know about opportunities in the industry. For example, one group of graduates who all got jobs at the same place testing educational games have now formed their own company. These students recently addressed a Game Design Workshop class and were a real inspiration.

Involve experts

Every semester, the School of Cinema-Television invites a number of guest speakers from the games industry to talk to students in the interactive entertainment program. At these sessions, students come to appreciate that there is no one way to design games. Each project is different and requires team members to be creative in a unique set of circumstances. Learning how veteran

gamemakers approach their craft helps students become better decision makers at every level of game development.

While the rapid evolution of technical platforms has thus far largely driven game development, the industry’s future growth will depend on designers’ ability to create engaging, immersive player experiences. In a presentation at USC last year, a noted designer commented that when playing one game he felt guilt over the actions of a simulated creature when it beat up an innocent character. “I’ve never felt guilty when I watched a film or read a book,” he said. “The emotional palette of this medium is very different from other media. We’ve only begun to explore it.”

The purpose of games education is not to fill the ranks of the game industry but to fully explore the nature of the medium, to gauge its potential, and to articulate a creative vision not limited by current technological capabilities. A play-centric approach to the study of games is a step toward that ultimate goal. ■

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