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VIDEO GAMES: OPPORTUNITIES FOR INFORMATION SYSTEMS & TECHNOLOGY ENROLLMENT

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ABSTRACT

Enrollment in information systems and related fields has been on the decline for over a decade. At the same time, video games are increasing in popularity, especially with undergraduates. Departments at 222 American schools offering video game related undergraduate degrees were analyzed to determine which academic fields have integrated games into their curricula. A majority of the programs were offered either by art / design departments or computing departments, with only one program hosted by a business school. Opportunities still exist within information systems and technology programs to incorporate video games as part of their curriculum.

Keywords: video games, IS education, IT education, CIS education

INTRODUCTION

Video games are ubiquitous in North America. Recent studies by the Pew Internet & American Life Project estimate that 97% of teens and 53% of adults play video games [7] [6]. The average video game player is estimated to be in their mid-thirties [6] [5]. It is not only men and boys who play video games. Fifty percent of adult women play video games [6], and more than twice as many women play video games than boys under the age of 18 [5]. Alongside the rise in social media and the proliferation of devices, gaming has become even more accessible within Facebook and on mobile phones. Social games company Zynga, creator of Farmville, boasts 60 million daily and 232 million monthly users [11]. The massively multiplayer online game World of WarCraft had 12 million subscribers in 2010 [2].

The video game market shows no signs of waning. U.S. video game sales in 2010 represented \$15.9 billion on software, for a total of \$25.1 billion when hardware and accessories are included [5]. In 2010, an estimated 120,000 jobs in the United States rely on game software, including 32,000 directly by the video game publishers [10].

In *Reality is Broken*, McGonigal argues that we should look to game design to transform work and other tasks into more

pleasurable experiences [9]. Today's video games are complex information systems. The overwhelming majority of undergraduate students are familiar with and play them. Is it possible that students' enjoyment of video games could be used as a gateway into interest in CS, IS, and IT fields?

CURRENT ACADEMIC DISCIPLINES RELATED TO VIDEO GAMES

Art, Design, Digital Media Studies

One type of video game degree program focuses upon the artistic aspects of games, including 2D and 3D animation, character modeling, texturing, and audio generation. Many of the tools and techniques used to create art for advertising, film, and fine art can also be used to generate assets for the video game industry.

Media studies, communication, and related programs offer their own style of degree, typically focusing on the analysis and generation of game narratives. These degrees apply existing theories from the fields of print, film, and journalism and extend them to cover video games. Programs often involve the creation of a "game design document", which may include information on the characters, story, gameplay, level design, and some artistic assets.

Computer Science

A third type of video game degree is offered from the computer science (CS) perspective. Video games are played on computers and/or custom hardware such as consoles. For many students, CS is the department for anything related to computing. Computing degrees vary in their treatment of video games, with some delving into the development of game engines, others looking at graphics and physics, or focusing on modifying existing games and using game development frameworks.

Information Systems and Technology

The diffusion and diversification of information systems and technology has led to a widening of needs and expectations.

Although CS and engineering are at the heart of video game hardware and game development, there are still many positions outside of development, within video game companies that require a familiarity with technology, but not the depth that a CS degree requires.

Management strategies Information Systems (IS) and Information Technology (IT) schools teach concerning software development could easily be extended to cases involving video games. For example, waterfall project management methodology and plans measured in years do not always meet the needs of digital agencies or prototype developers. Agile development methodologies and related project planning may be combined with plan-based to provide more effective development [1].

TRENDS IN ENROLLMENT AND GAME CURRICULA

Decreasing enrollment in CS, IS, IT, and Computer Information Systems (CIS), has been a problem for over a decade. Enrollment in computing degrees declined 32% between 2000 and 2004 [8], and although the number of undergraduate computing degrees awarded in 2010 increased from 2009, this was the first annual increase after a long decline, according to the Taulbee Survey [3]. The gender gap is still present, with women accounting for only 13.8% of bachelor's graduates in CS in 2010 [3].

Art/Design/Media Studies, Computer Science, and Business/Information Systems/Technology are academic fields related to video games. To what extent are these three fields already offering video game related education at the university level? What academic disciplines are offering video game related degrees? Is the market already saturated, or is there additional opportunity to introduce video games into certain curricula?

METHODS

The Entertainment Software Association (ESA) is an American association of video game publishers and developers. The ESA also maintains a list of U.S. colleges and universities that offer video game courses and degrees. Using the list provided on their website [4], a list of all schools, the level of degree(s) and/or certificate available, and their location was recorded. Since the list included a wide range of educational institutions, such as technical schools, community colleges, and universities, the list was narrowed to include only those offering Baccalaureate degrees. This eliminated those schools only offering a

single class related to games, as well as non-traditional schools with brief offerings such as 3-day courses.

We visited each school's website and made note of the department(s) offering the video game related degree. If the home department was not specified or was too broad, such as Arts and Technology, the degree's course sequence and course descriptions were reviewed to categorize the program. If the home department did not fit within one of the previously described academic fields, the name of the department was noted. For those degrees that represented a collaboration between disciplines or that offered concentrations hosted by diverse departments, each department was noted.

RESULTS & DISCUSSION

The initial list included 223 schools, but one school was removed because no information about its curriculum or host department could be found. The majority of the programs were hosted by either an art /design department or a computing department (*Table 1*).

Table 1 - Primary discipline offering video game degree; degrees with cross-departmental collaboration and/or concentrations are represented within each primary discipline.

Primary Discipline	# of Schools
Art / Design / Digital Media Studies	125
Computing	105
Business	1
IT	3
Other	3
	<i>Computer Engineering; Computer Graphics; Electrical and Computer Engineering</i>
Hybrid Departments	3
	<i>Technology & Digital Media; Telecommunications, Information Studies and Media; CIT and Graphics</i>

Six schools had departments that were difficult to classify, for two reasons. Three departments have foci different from computer science, two in engineering and one specifically in computer graphics. The remaining three schools had departments that span across both art/design and computing, such as "Computer Information Technology and Graphics".

Only one business department offers a game-related Bachelor's degree: Interactive Games Management (BBA) at St. Edward's University in Texas. Three programs offer degrees in Technology or Information Technology departments, but their curricula do not require core business courses. No Information Systems departments host video game related degrees. Since video games can be complex information systems, it is surprising that so few IS and IT schools house video game-related degrees.

Table 2 - Geographical distribution of video game programs within the United States, by state.

State	Programs within the State
California	41
Illinois	16
Florida	15
Minnesota, Texas	12
Massachusetts, Michigan	10
New York	9
Colorado, Georgia	8
Pennsylvania	7
Indiana, Wisconsin	6
Maryland, Utah, Virginia	5
Arizona, Ohio	4
Missouri, North Carolina, Washington	3
Iowa, Louisiana, New Hampshire, New Jersey, Nevada, Oklahoma	2
Alabama, Connecticut, Washington DC, Delaware, Hawaii, Idaho, Kansas, Kentucky, Montana, North Dakota, Nebraska, New Mexico, Oregon, Rhode Island, South Carolina, South Dakota, Tennessee, Vermont	1
<i>Total within United States</i>	222

The geographical distribution of programs within the United States does not follow population distribution or location of game development studios (Table 2). California has 41 of the 222 total programs, but popular game development industry locations like Washington have only 3 programs. Six states do not have any video game degree programs listed with the ESA.

CONCLUSIONS

One of the limitations of this research is that the accreditation of the programs was not considered. Within the United States, post-secondary programs may be regionally accredited, nationally accredited, or offered without accreditation. This affects whether students are eligible for student loans, but also can be used as a metric of rigor and academic value. Future work could further segment the data into regional, national, and not accredited programs for additional detail.

A second limitation is that only American schools are examined. The video game industry originated in the United States and its current employment is only rivaled by Japan. Future work could look at international programs, though validating a comprehensive list could be challenging.

The video game industry continues to expand its market and present emergent challenges for those working in all aspects of the industry. Despite the large number of schools offering video game related degrees, American information systems schools have not expanded their degree offerings. Games are complex, distributed information systems that most undergraduates are already familiar with. The inclusion of video games within traditional curricula may act as a gateway to better prepare those students moving into the video game and digital media industry.

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