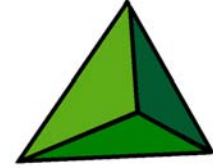




**ECONOMIC &  
WORKFORCE  
DEVELOPMENT**  
*through the*  
CALIFORNIA  
COMMUNITY  
COLLEGES

**BUSINESS AND WORKFORCE  
PERFORMANCE IMPROVEMENT INITIATIVE**



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***Industry Scan Report  
Los Angeles, Orange, and San Francisco Bay Regions***

**Video and Computer Game Industry**



**Centers of Excellence for  
Los Angeles, Greater Silicon Valley and Bay Region**

**October 2006**



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***Strategic Opportunity for Community Colleges in the  
Los Angeles/Orange County and  
San Francisco Bay Regions***

**Video and Computer Game Industry**

**October 2006**

Prepared By

Centers of Excellence for Los Angeles, Greater Silicon Valley and Bay Region  
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THE BUSINESS AND WORKFORCE PERFORMANCE IMPROVEMENT INITIATIVE IS A GRANT-FUNDED PROJECT THROUGH THE ECONOMIC & WORKFORCE DEVELOPMENT PROGRAM OF THE CALIFORNIA COMMUNITY COLLEGES. OUR MISSION IS TO STRENGTHEN CALIFORNIA'S WORKFORCE AND ADVANCE ECONOMIC GROWTH THROUGH EDUCATION, TRAINING AND JOB DEVELOPMENT.

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**BASED ON A 2006 SURVEY OF VIDEO AND COMPUTER GAME EMPLOYERS IN BOTH THE LOS ANGELES/ORANGE COUNTY AND SAN FRANCISCO BAY REGIONS, IT IS ESTIMATED THAT VIDEO AND COMPUTER GAME COMPANIES WILL REQUIRE AN ADDITIONAL 2,500 TO 4,500 WORKERS OVER THE NEXT 12 MONTHS ACROSS BOTH REGIONS, WHILE COMPANIES THAT PROVIDE SERVICES TO THE INDUSTRY MAY REQUIRE AN ADDITIONAL 1,500 TO 2,500 EMPLOYEES ACROSS BOTH REGIONS.** *Source: Godbe Research*

## **Executive Summary**

The video and computer game industry is an emerging and growing sector in the Los Angeles/Orange County and San Francisco Bay regions of California. With increasing employment opportunities, livable wages and a defined career path for advancement, the industry's growth presents strong opportunities for community colleges to build upon their existing programs.

A central feature of this report is the release of original research on the industry conducted for the Centers of Excellence by Godbe Research, a recognized leader in labor market research. The results of this study confirm a strong strategic opportunity for the community colleges to prepare the current and future labor force needed for employment in the video and computer game industry. Company demand for employees is currently outstripping the supply of suitably qualified applicants, and the competitive environment for skilled labor in the industry is creating employee shortages.

Colleges who can create or adapt courses, and establish partnerships with local industry and public workforce agencies, will be positioned to meet the growing workforce demand. The occupational skill areas currently needed by the industry are found in the following functions: game design, art, programming, production and testing. As a unique sub-sector of the digital media industry, these occupations have specific skill and experience requirements that cannot be fully met by the existing digital media programs and courses at community colleges. A better understanding of the gap between industry needs and the colleges' ability to respond will be key to developing and strengthening programs for the industry.

This report summarizes the key findings and recommendations, provides an overview of the industry, its economic impact, training needs and possible college responses.

## **Key Study Findings**

The following are the key findings that emerged from an analysis of survey responses from 93 video and computer game employers in the Los Angeles/Orange County and San Francisco Bay regions during 2006:

### **1. A Need for Additional Training Programs to Help Meet Growing Demand**

The survey findings provided strong indication that the company demand for employees at both the industry and occupational level is currently outstripping the supply of suitably qualified applicants. In addition, the particularly high expected employment growth over the next year indicates a strong need for additional training and development of the local workforce with the skills required by the industry in order to meet growing demand for workers in the years ahead.

### **2. A Need to Improve the Technical Competence and Soft Skills of Entry-Level Applicants**

In four out of five of the occupational functions covered by the study, technical competence was the skill in which employers considered entry-level workers to be most deficient. Soft skills, including written and oral communication, interpersonal skills, and the ability to work in a team, also featured strongly among the overall occupational skill deficiencies cited by survey respondents.

### **3. A Need for the Development of Flexible Training Programs**

The video and computer game industry is a relatively new, emerging industry that has undergone rapid growth since its inception 30 years ago. Because the development of the industry is closely tied to technological advances, particularly through the introduction of new game platforms, this presents issues for the future development of its workforce. The rapidly changing and evolving nature of the industry make it difficult to predict its future direction as well as the specific skills and knowledge which will be required of its workforce in the years ahead. Training programs must therefore have the flexibility to adapt to and reflect the changing nature of the industry as it develops.

### **4. An Opportunity to Communicate the Increasing Opportunities for Female Workers in the Industry**

In 1987, women accounted for 14% of gamers. By 2005, women accounted for 31% of the general entertainment software market, and research has shown that women are now the primary consumers of casual online games (64%). With increasing numbers of women entering the video and computer game market as players, the industry is increasingly recognizing the importance of women's role in the development of games, particularly for games aimed at a female audience. This has led to growing opportunities for female workers in the industry.

**5. *An Opportunity to Retrain Workers from Crossover Industries***

There is potential for crossover employment to the video and computer game industry from many other industries, including the film and television industry, software development, telecommunications, industrial design, architecture, educational technology, aerospace, IT security, and many sciences.

**6. *An Opportunity to Help Companies Retain Valuable Employees through Long-Term Training Programs***

The high proportion of companies reporting difficulties retaining valuable employees provides further indication of the current competitive environment for skilled labor in the industry which is being driven by employee shortages.

## Overview of the Opportunity

Preliminary research conducted by the Centers of Excellence in 2005 indicated that the video and computer game industry in the Los Angeles/Orange County and San Francisco Bay regions was emerging as a significant sub-sector of the digital media industry. However, no data existed in the two economic regions on:

- The current number of firms and employees in the industry
- Future employment trends and potential growth in employee demand
- Whether entry-level opportunities exist for community college graduates with an Associate-level degree or certificate of completion in this occupational area.

This lack of data created difficulties for determining if a significant opportunity exists for community colleges in the Los Angeles/Orange County and the San Francisco Bay Region to serve the workforce needs of this industry.

In February 2006, the Los Angeles and San Francisco Bay Area Community College Centers of Excellence hired Godbe Research to conduct a workforce demand study of the video and computer game industry within two regions in California: Los Angeles/Orange County, and the San Francisco (10-county) Bay region. The primary research objectives of the study were:

- To identify the workforce needs of the video and computer game industry by region, with a focus on identifying where labor market gaps are the greatest.
- To evaluate existing and future workforce challenges and opportunities in the industry;
- To identify occupations of interest that provide the greatest growth potential and can be served through community college programs; *and*
- To gather information about education and training requirements, and skill requirements by occupation.

## The Two Major Research Components to this Study

1. *The Development of an Industry Database.* Using existing sources relevant to the industry, Godbe Research created a complete database of video and computer game companies located in the two regions covered by the study. Two different types of video and computer game companies were identified and separated in the industry database:
  - “*Sample A*” companies – defined as video and computer game companies which are directly and only involved in the video and computer game

industry. The focus of these companies is typically on developing and/or publishing video and computer games.

- “Sample B” companies – defined as companies that have a close and direct involvement with the video and computer game industry, typically through the provision of services to the industry, such as animation, production, or localization services. These companies may also provide services to other industries in addition to the video and computer game industry. Appendix B summarizes information about the 543 companies that were identified in the two regions.
2. Survey of Video and Computer Game Employers. Using the newly developed industry database, targeted surveys were conducted with representatives from 93 video and computer game employers within both regions in order to gain insight into current and emerging workforce demands and issues in the industry, with a focus on the occupations of interest to community colleges. Appendix B summarizes information about the 93 companies who responded to the survey and outlines the survey methodology used by Godbe Research.

## Industry Overview

### Size of the Video and Computer Game Industry

It is estimated that 38% of all US video and computer game companies are located in the state of California. Research indicates that approximately one half of these California companies are based in the Los Angeles and Orange County region, while a third are based in the San Francisco Bay region. See Appendix C for a summary of the following:

- Locations of video and computer game companies based in the United States
- Locations of video and computer game companies based in California
- Summary of California based companies by industry segment

Drawing on data provided by industry studies, responses to the employer survey, and research carried out during the company database development process, ***it is estimated that the video and computer game industry currently supports between 10,000 and 15,000 direct employees (those employed in Sample A companies) in the Bay Area region, and between 6,000 and 10,000 employees in the Los Angeles and Orange County region.***

Although a similar number of Sample A companies are located in each region, the Bay Area is home to a higher number of large companies. In addition to these direct employees, ***it is estimated that the Bay Area’s video and computer game industry supports an additional 4,000 to 6,000 employees in companies that provide direct***

**services to the industry (Sample B companies), compared to between 7,000 and 14,000 in the Los Angeles and Orange County region.**

### **Console Games Dominate Industry**

The video and computer game industry is currently dominated by the console game sub-sector – consumer spending on console games represented 76 percent of total spending in 2004. Over the next five years, industry experts forecast that the largest growth markets will be for online and wireless games, while the online capabilities of new ‘next-generation’ console systems will continue to drive growth in the console sub-sector. The video and computer game industry will continue to evolve at a rapid pace, being driven largely by the development of new or upgraded game platforms, other technological developments, and changes in game player demographics, demands and preferences.

### **High Level of Temporary and Project-Based Employment**

The findings of the employer survey provided further indication that the video and computer game industry, which is largely project-driven, relies heavily on hiring employees on a temporary or contract basis. The survey found that:

- 56% of companies currently employed temporary or contract-based workers.
- Temporary employees represented 27 % of the total workforce across all companies.
- A similar proportion of companies hired temporary workers across both regions (54% in the Bay Area vs. 57% in Los Angeles and Orange County).
- A higher proportion of Sample A companies in the Los Angeles and Orange County region hired temporary employees compared to those in the Bay Area region (66% vs. 55%).
- Temporary employees represented a higher proportion of the total workforce in Sample B companies compared to Sample A companies (48% vs. 23%).

### **High Level of Outsourcing in the Industry**

- 46% of companies reported that they outsourced at least one function or department.
- A higher proportion of Bay Area companies outsourced at least one function compared to their counterparts in Los Angeles and Orange County (51% vs. 43%);
- The findings of other research studies suggest that companies in the two regions covered by the study are less reliant on outsourcing than US companies in general.
- The art and programming functions are the most likely to be outsourced of all the functions.
- Most companies outsource functions within California (62%).

## Economic Impact of the Industry

*“To sustain the industry’s growth rate, the publishers need to develop the kind of games that turn the casual female gamer into a core gamer.”*

**Anita Frazier,  
NDP Group**

Research by the NPD Group indicates that in the US, video and computer game sales reached \$7 billion in 2005. The video and computer game industry is forecast to continue to experience strong growth over the next few years. According to the Pricewaterhouse Coopers study, the cumulative average rate of entertainment software sales in the US is expected to remain at 15 percent a year through 2010.

*Table 1* below provides an overview of expected growth trends in the industry by segment. While forecasts indicate that the market for off-line PC games will continue to deteriorate, the market for online PC games is expected to grow strongly over the next few years (research has shown that over 13% of broadband users now subscribe to an online gaming service). In particular, the market for casual games, which includes both online and mobile games, is forecast to grow to over \$2 billion in the US by 2008, from \$600 million in 2004.

*Table 1: Growth Trends in the Video and Computer Game Industry<sup>1</sup>*

Hardware	Connectivity	
	Off-line	Online
PC	Mature	Strong Growth
Console	Moderate Growth	Strong Growth
Wireless	Strong Growth	Strong Growth

It is estimated that the sales generated by video and computer game companies in the LA/Orange and San Francisco Bay regions covered by the study accounted for between a quarter and a third (\$1.75 to \$2.33 billion) of the U.S. total in sales during 2005. Another indicator of the economic impact of the industry was calculated by multiplying employment estimates for each region by the estimated average wage for video and computer game employees in California in 2005. The calculations indicated that the level of gross income paid to workers directly involved in the industry<sup>2</sup> was around \$800 million to \$1.2 billion in the San Francisco Bay region and \$475 to \$800 million in the Los Angeles/Orange County region.

<sup>1</sup> Digital Broadband Content: The Online Computer and Video Game Industry – OECD, 2005.

<sup>2</sup> Covering employees in Sample A companies only.

## Occupational Outlook

### Strong Employment Growth

**Total employment among all responding companies is expected to increase by around 1,700 employees over the next 12 months, representing a growth rate of 21 percent.** This indicates a highly positive outlook for the industry, at least in the short-term.

Table 2 below provides a breakdown of expected employment growth for each sample group and region among responding companies. The figure shows that overall employment growth expectations over the next 12 months are higher in the Los Angeles/Orange County region (31%), when compared to the Bay Area region (14%). Particularly strong employment growth is anticipated in Sample A companies in the Los Angeles/Orange County region (40%) and in Sample B companies in the Bay Area (31%), although this latter figure should be treated with some caution due to the low sample size.

Table 2: Expected Total Employment Growth over the Next 12 Months by Sample Group and Region

	Sample A	Sample B	Total
Bay Area	13%	31%	14%
Los Angeles/Orange Counties	40%	12%	31%
Total	23%	16%	21%

**Based on current employee estimates across both regions, it is estimated that in total an additional 4,000 to 7,000 employees will be needed in the video and computer game industry over the next 12 months in the two regions.**

It is estimated that all Sample A companies in the Bay Area region (127) will require an additional 1,000 to 1,500 employees over the next 12 months, while all Sample B companies in this region (114) will have a need for an additional 750 to 1,250 employees. By comparison, it is estimated that all Sample A companies in the Los Angeles/Orange County region (125) will require an additional 1,500 to 3,000 workers over the next 12 months, while all Sample B companies (177) will need an additional 750 to 1,250 employees.

### General Shortage of Suitable Workers

Employer feedback indicates that general shortages of suitable applicants are already creating difficulties for the industry. Of the companies that responded to the survey:

- 63% reported facing difficulties finding non entry-level employees with adequate skills and work experience. This percentage was even higher among Bay Area Sample A companies (71%) and Los Angeles and Orange County Sample A companies (82%).
- 46% reported difficulties finding entry-level employees with adequate training and education. This percentage was higher among Bay Area companies than those in Los Angeles and Orange County (53% vs. 40%).

The current competitive environment between employers also indicates that shortages of suitable candidates exist across both regions.

- 52% of employers reported facing “Great” or “Some” difficulty retaining employees that could be hired by competitors. This percentage was even higher among Sample A companies in both the Bay Area (61%) and the Los Angeles and Orange County region (62%).
- 30% of respondents always or frequently recruited employees from outside of California for the programming and art functions.

### **Employment Projections and Employee Demand by Occupation**

Employment growth over the next 12 months is forecast to be very strong for all occupational groups covered by the study. Survey data on projected employment growth and employer difficulties in finding suitable applicants for job openings is outlined in *Table 3* below by job function:

*Table 3: Summary of Occupational Outlook Findings by Job Function for Responding Companies*

<b>All Positions</b>	<b>Game Design</b>	<b>Art</b>	<b>Programming</b>	<b>Production</b>	<b>Testing</b>
<b>Number of Companies</b>	48	53	44	61	31
<b>Average Employees per Company</b>	7.3	17.8	21.5	10.4	26.6
<b>Current Employees</b>	349	943	945	633	825
<b>Projected Employees in 12 months</b>	463	1,208	1,237	753	1,032
<b>Employment Growth over Next 12 months</b>	33%	28%	31%	19%	25%
<b>% Increasing Employment over Next 12 months</b>	51%	70%	67%	52%	56%
<b>Some/Great Difficulty Finding Applicants</b>	73%	67%	80%	63%	33%
<b>Always/Frequently Recruit from Outside California</b>	26%	30%	30%	22%	3%

Occupational employment growth is expected to be particularly strong in the Los Angeles/ Orange County region. Responding companies indicated that they expect to increase overall employment by 44 percent across all occupational functions in the next 12

months. By comparison, employment growth in the Bay Area region is not expected to be as strong, rising by an expected 16 percent across all five occupational groups in the next year.

It should be noted that these growth rate expectations are likely to exceed the actual growth in industry-wide occupational employment which will occur over the next 12 months, due to the likelihood that the companies which responded to the survey had a greater interest and need for future workforce development than companies which did not respond. However, these projections do provide a strong indication that employment demand in the occupational functions covered by the study is likely to undergo rapid growth over the next year.

### **Career Pathways**

There are several associations devoted to the video and computer game industry. The International Game Developers Association (IGDA) has provided information on career paths titled "Breaking In." There appear to be clear pathways providing good entry-level wages and opportunities for upward mobility. At this time, there also seems to be significant opportunities for community college students who possess strong creative and technical skills, which can be demonstrated through a portfolio focusing on skills utilized in the specific occupational area that they are pursuing. Appendix D has a detailed summary of the job functions in the industry, related career pathway information and the results of a 2004 industry salary survey. Additional information can be accessed at IGDA's web site: <http://www.igda.org/breakingin/>.

## **Industry Training Needs**

### **Skills and Competencies Required**

The most important skill requirements of those tested for entry-level applicants by job function are:

- **Game design:** creative skills (29%) and technical competence (23%);
- **Art:** artistic skills (53%) and technical competence (26%);
- **Programming:** technical competence (50%) and ability to work in a team (16%);
- **Production:** interpersonal skills (26%) and ability to work in a team (15%);
- **Testing:** written communication (23%) and a passion for games (19%).

In four of the job functions tested – game design, art, programming, and testing – the skill which entry-level applicants were found to be most deficient in was technical competence. This deficiency was most apparent among applicants for the programming (23%) and testing (23%) functions. For the production function, entry-level applicants were

considered to be most lacking in interpersonal skills, which was the skill considered to be most important for this job function.

An Occupational Profiles Report for employment in the five functional areas of Game Design, Art, Programming, Production and Testing is available through the California Community Colleges. For information on how to obtain this report see Appendix E.

**Entry-Level Positions Typically Do Not Require a Bachelor’s Degree**

The survey found that a majority of responding companies *did not* require entry-level applicants to hold at least a bachelor’s degree for the game design (56%), art (55%) or testing (73%) functions. In addition, 82 percent of respondents indicated that their company would consider hiring individuals into occupations with set degree requirements, such as a Bachelor’s degree, even if they did not have that qualification *but had relevant work-related experience or a specific certificate*. Table 4 below summarizes important information about entry-level positions in the industry:

Table 4: Entry-level Positions in the Industry

Typical Job Title	Junior Game Designer	Artist	Junior Programmer	Assistant Producer	Game Tester
<b>% Require Bach. or Higher</b>	44%	45%	78%	51%	27%
<b>% Require Less than a Bach.</b>	56%	55%	22%	49%	73%
<b>Median Work Experience</b>	< 1 year	< 1 year	1-2 years	1-2 years	No formal experience
<b>Most Important Skill</b>	Creative	Artistic	Technical competence	Interpersonal	Written communication
<b>Biggest Skill Deficiency</b>	Technical competence	Technical competence	Technical competence	Interpersonal	Technical competence
<b>Typical Salary (US)</b>	\$43,486	\$45,675	\$52,989	\$51,364	\$24,797

**Preferred Methods of Training Delivery**

The survey addressed the level of use of four employee development practices of interest at video and computer game companies. The order in which each practice was read to respondents was randomized to avoid a position order bias.

The most popular employee development practices used by the responding video and computer game companies was “Formal on-the-job training” (63%), followed by “Employer-paid outside training” (49%). By comparison, just over a fifth of employers

reported making use of “Tuition assistance at a college or university” in the development of their employees. *Table 5* below indicates that a higher proportion of Bay Area companies (70%) used “Formal on-the-job training” compared to those in the Los Angeles and Orange County region (58%).

*Table 5: Proportion of Companies Using Employee Development Practices by Sample Group and Region*

<b>Company Group/ Region</b>	<b>Formal On-The-Job Training</b>	<b>Employer-Paid Outside Training</b>	<b>Career Advancement Programs</b>	<b>Tuition Assistance</b>
<b>Sample A</b>	59%	54%	25%	28%
<b>Sample B</b>	69%	41%	26%	9%
<b>Bay Area</b>	70%	57%	26%	24%
<b>LA/OC</b>	58%	43%	25%	19%
<b>All Companies</b>	<b>63%</b>	<b>49%</b>	<b>25%</b>	<b>21%</b>

## **Industry Workforce Challenges and Opportunities**

The future economic prosperity of the video and computer game industry is highly dependent on the availability of a workforce that is both large enough and has the necessary education, training and skills to meet the challenges posed by global and national competition. The required mix of skills creates challenges and problems in the education of future workers and the up-skilling of existing workers. In order to gain some insight into the current workforce issues of importance to the industry, survey respondents were asked to rate the level of difficulty which their firm faced in addressing each issue.

*Table 6* indicates that, of the five workforce issues considered, employers faced the most difficulty “Recruiting non entry-level employees with adequate skills and work experience” (63%: “Some” or “Great” difficulty), followed by “Retaining valuable employees that could be hired by competitors” (52%), and Recruiting entry-level employees with adequate training and education” (46%). By comparison, only 30 percent of respondents faced “Some” or “Great” difficulty “Recruiting a diverse workforce.” This finding is surprisingly low, given that female employees currently represent only around 10 percent of the total industry workforce, which suggests that this question may have been affected by some level of response bias.

Table 6: Proportion of Companies Facing Difficulty with Workforce Issues by Sample Group and Region

Company Group/ Region	Recruiting Non Entry-Level Employees	Retaining Valuable Employees	Recruiting Entry-Level Employees	Developing Strategies to Retain Employees	Recruiting a Diverse Workforce
Sample A	77%	61%	48%	50%	35%
Sample B	40%	35%	41%	29%	23%
Bay Area	66%	58%	53%	49%	37%
LA/OC	60%	47%	40%	38%	25%
All Companies	63%	52%	46%	42%	30%

Douglas Lowenstein, President of the Entertainment Software Association, addressed six global challenges in a 2005 speech to his Association members that he believes must be overcome if the industry is to surge forward as the market leader of the entertainment services of the 21<sup>st</sup> century:

1. Broaden the game audience by making more games with mass-market appeal.
2. Create more complete game experiences with more emotional impact, better stories, and more interesting and complex characters.
3. Ensure games are more accessible and easier to play.
4. Create new financing models that bring in new sources of capital to fund game development.
5. Continue to develop and exploit emerging platforms, specifically online and mobile.
6. Overcome cultural resistance and establish cultural credibility as video games are under constant attack from politicians.

## Community Colleges and Industry

### High Level of Interest in Community College Program Development

Respondents indicated a high level of interest in all four proposed education and training programs that could be developed by California's community colleges in the years ahead. The development of a cross-disciplinary two-year associate's degree to prepare students for a video game-related bachelor's or graduate degree received the most overall interest (59%), followed by a highly-specialized two year associate's degree program to meet the specific needs of local game companies (58%).

*"Maintaining strong lines of communication between industry and academia is vital to the health of degree programs relating to computer graphics and to the health of the industry as a whole."*

**Rhythm & Hues**

Overall, Sample A companies expressed more interest in the development of each of the programs compared to their Sample B counterparts:

- 69% vs. 43% interest in a cross-disciplinary two-year associates degree program to prepare students for a video-game related bachelor's or graduate degree;
- 64% vs. 49% interest in a highly specialized two-year associates degree program designed to meet the specific workforce needs of local game companies;
- 59% vs. 37% interest in customized training programs;
- 55% vs. 34% interest in a game design and development certificate program.

A majority of companies (62%) said they would be interested in working with the community colleges in their region to help develop these types of programs. A higher proportion of Sample A companies in the Los Angeles and Orange County region expressed an interest in working with local community colleges compared to their counterparts in the Bay Area region (72% vs. 59%).

### **Existing Community College Programs and Offerings**

Digital and multimedia programs exist throughout the community colleges. Appendix F provides a list of the current Education and Training providers for the digital media industry in the two regions studied. The list includes both community college programs and other providers. A few colleges in Los Angeles and the Bay Area are already offering certificates in the area of video and computer games.

Community colleges who have an interest could adapt programs to meet the labor force needs and requirements of the video and computer game Industry identified in this report. Colleges will need to consider the following: a flexible and interdisciplinary program design; creation of pathways for student enrollment including workers from crossover industries and females; establishing partnerships with public workforce agencies, industry, associations, high schools and universities; and acquiring supplemental grants and other resource funding.

### **Strategic Partnering**

The Los Angeles County, Greater Silicon Valley and Bay Region Centers of Excellence have worked with multiple partners to publish this report. These partners include the California Community Colleges Statewide Multimedia Entertainment Initiative, the Entertainment Economy Institute (EEI), the Employment Development Department Labor Market Information Division (LMID), the Los Angeles City and Silicon Valley Workforce Investment Boards, the Los Angeles Economic Development Corporation, and Game Developer Magazine. The Center also utilized information from Industry Associations (see Appendix G) such as the International Game Developer's Association (IGDA), the Entertainment Software Association (ESA), as well as primary research performed by Godbe Research which provided critical employer information about the emerging

strategic opportunity in this industry. Engaging these strategic partners will be critical for community colleges responding to the opportunities and recommendations outlined in this report.

## Conclusions and Recommendations

The following key workforce issues, needs and training opportunities have emerged from this report. It is recommended that community colleges adapt existing programs and/or create new programs in order to respond to the workforce issues and opportunities outlined below.

- 1. Community colleges have an opportunity to develop long-term partnerships with local companies in order to maintain a fresh perspective about the key skill and knowledge requirements at the industry and occupational levels.***

This opportunity is reinforced by the positive feedback received from video and computer game companies – 62% expressed an interest in working with community colleges in their region to help develop the types of programs required to generate a highly-skilled workforce for the industry in the years ahead.

- 2. Community colleges have an opportunity to build on existing programs and develop new education and training programs which will be valuable for the Industry.***

This opportunity is reinforced by the high level of interest expressed by local video and computer game companies in the development of the following programs:

- A cross-disciplinary two-year associate degree program to prepare students for a video game-related bachelor's or graduate degree (59%)
- A highly-specialized two-year associate's degree program designed to meet the specific workforce needs of local game companies (58%)
- Customized training programs for employee skill development (51%)
- A game design and development certificate (47%)

- 3. Community colleges have an opportunity to develop and implement training programs which place more emphasis on developing the specific skills sets required by the industry among potential entry-level applicants.***

- 4. Community colleges have an opportunity to expand the local workforce pool by communicating the increasing opportunities which exist in the industry, and expanding upon the training programs which are available to local female and youth populations.***

**5. Community colleges have an opportunity to provide upgrade training for workers from a number of crossover industries in order to help increase the supply of applicants for demand occupations.**

Conversely, returning students who hold a BA/BS degree and who have been dislocated, are changing careers, or need to upgrade their skills for career advancement are excellent candidates for training. For example, West Valley College in Santa Clara County reported that more than 50% of their digital media students already have BA Degrees and the average age is 35. Colleges should work with local Workforce Investment Boards (WIBs) to serve technology workers who have transitioned out of high tech jobs and are seeking retraining and employment opportunities.

**6. Community colleges have an opportunity to work with video and computer game companies in their region to develop long-term training programs and strategies which are linked to life-long employee development and career advancement in companies where retention issues are problematic.**

## Next Steps

### Additional research on the industry may include:

- Conducting a more in-depth analysis of the specific training and skill requirements of employers at the occupational level, with a focus on technical competencies and soft skill needs.
- Further exploration of the retraining opportunities for workers from crossover industries.
- A more in-depth analysis of the future direction of the industry and the types of education and training programs required to sustain and enhance the industry's growth in the years ahead.

## Appendix A: How to Utilize this Scan Report

### ***About Us - Description of BWPI***

The Business and Workforce Performance Improvement (BWPI) initiative is focused on building the capacity of the colleges in the area of economic and workforce development to enhance their ability to deliver education and training services to businesses and workers in high growth industries, new technologies, and other clusters of opportunities.

The Centers of Excellence (COE) within BWPI provide information regarding workforce trends, increasing awareness and visibility about the colleges economic and workforce development programs and services, and building partnerships with business and industry.

The difference this will make to the colleges is that it will position them as THE workforce partners of choice to business and industry and ensure that college programs are current and responsive. This will contribute to the overall economic vitality of the communities in which they serve.

### ***How to Use This Industry Scan:***

The Centers of Excellence within the Business and Workforce Performance Improvement Initiative of the California Community College Economic and Workforce Development Program have undertaken Industry Scanning to provide targeted and valuable information to community colleges on high growth industries and occupations.

This scan is intended to assist the decision-making process of Community College administrators and planners in addressing local and regional workforce needs and emerging job opportunities in the workplace as they relate to college programs. The information contained in this report can be used to guide program offerings, strengthen grant applications, and support other economic and workforce development efforts.

This report is designed to provide current industry data that will:

- Define potential strategic opportunities relative to an industry's emerging trends and workforce needs;
- Inform and influence local college program planning and resource development; and
- Promote a future-oriented and market responsive way of thinking among stakeholders.

This Industry Scan included a review of the California Regional Economies Project reports and Employment Development Department (EDD) Labor Market Information (LMID) projections that cover the communities in this region, as well as many other sources as listed.

### ***Important Disclaimer:***

All representations included in this Environmental Scan product/study have been produced from a secondary review of publicly and/or privately available data and/or research reports. Efforts have been made to qualify and validate the accuracy of the data and the reported findings. The purpose of the Environmental Scan is to assist the California Community Colleges to respond to emerging market needs for workforce performance improvement. However, neither the Business and Workforce Performance Improvement Centers of Excellence, COE host college or California Community College System are responsible for applications or decisions made by recipient Community Colleges or their representatives based upon this study including components or recommendations.

## Appendix B: Methodology

### Survey Methodology

The Survey Methodology table below briefly outlines the methodology utilized for this project. A total of 93 video and computer game companies completed either a telephone or Internet version of the survey, representing a total universe of 543 companies across both study regions. Fifty-eight of the 252 Sample A companies and 35 of the 291 Sample B companies identified in the universe database completed the survey.

*Table B1: Survey Methodology*

<b>Technique</b>	Telephone and Internet survey of video and computer game companies and companies that provide direct services to the industry
<b>Universe</b>	252 Video and computer game companies (Sample A) 291 Companies that provide services to the game industry (Sample B)
<b>Number of Respondents</b>	58 Video and computer game companies 35 Companies that provide services to the game industry
<b>Field Dates</b>	April 26 to May 31, 2006

Overall, 39 responses were gathered from companies in the Bay Area region, including 29 Sample A companies and 10 Sample B companies. A total of 54 responses were gathered from companies in the Los Angeles and Orange County region, including 29 Sample A companies and 25 sample B companies.

### Questionnaire Design

Godbe Research worked closely with the Los Angeles and San Francisco Bay Area Centers of Excellence during the development phase of the survey questionnaire.

### Randomization of Questions

To avoid the problem of systematic position bias - where the order in which a series of questions is asked systematically influences the answers to some of the questions - several of the questions in this survey were randomized such that respondents were not consistently asked the questions in the same order. The series of items relating to industry workforce issues, employee development practices, recruitment practices, and interest in training and education programs (Question 7, 8, 9 and 22) were randomized to avoid the systematic position bias.

## Employment Forecasts

It should be noted that, where companies provided details of current employee data for an occupational group, but did not provide an estimate of employment for that occupational group in 12 months time, the overall company growth rate for the next 12 months was used to estimate the number of employees in that occupational function in 12 months time.

## Data Limitations

It is important to be aware of some of the data limitations encountered during this workforce study when developing and conducting future workforce studies of the video and computer game industry. The main data limitations encountered were:

- A lack of available industry and occupational employment data due to classification issues with the current NAICS and SIC coding systems;
- The relatively small sub-group of sample sizes which limited the depth of analysis which could be carried out and conclusions which could be drawn from the employer survey data;
- The difficulties faced by employers in providing long-term employment growth projections for the industry
- A general shortage of industry-specific studies and region-specific data available for this industry.

*Table B2: Number and Proportion of Companies Identified in Industry Database by Sample Group and Region*

	<i>Sample A</i>	<i>Sample B</i>	<i>Total</i>
<i>Bay Area</i>	127 (23.4%)	114 (21.0%)	<b>241 (44.4%)</b>
<i>Los Angeles and Orange Counties</i>	125 (23.0%)	177 (32.6%)	<b>302 (55.6%)</b>
<i>Total</i>	<b>252 (46.4%)</b>	<b>291 (53.6%)</b>	<b>543 (100%)</b>

Table B3: Number of Companies (with Number of Employees) who Responded to the Survey by Sample Group and Region

<i>Region</i>	<i>Sample A</i>		<i>Sample B</i>		<i>Total</i>	
	<i>Companies</i>	<i>Employees</i>	<i>Companies</i>	<i>Employees</i>	<i>Companies</i>	<i>Employees</i>
<b>Bay Area</b>	29	4,200	10	302	<b>39</b>	<b>4,502</b>
<b>LA and Orange Counties</b>	29	2,400	25	999	<b>54</b>	<b>3,399</b>
<b>Total</b>	<b>58</b>	<b>6,600</b>	<b>35</b>	<b>1,301</b>	<b>93</b>	<b>7,901</b>

## Appendix C: Industry Data

### Location of US-Based Video and Computer Game Companies

Research suggests that California-based video and computer game companies make up a substantial proportion of all US-based companies involved in the video and computer game industry. This is supported by the *Gamasutra* company directory analysis, which found that 38 percent of listed companies were based in California. *Table C1* below lists the top US states by number of organizations listed in the directory.

*Table C1: Locations of US Companies*

<b>US State</b>	<b>Number of Companies</b>	<b>% of Total Companies</b>
<b>California</b>	771	38.3%
<b>Texas</b>	132	6.6%
<b>New York</b>	129	6.4%
<b>Washington</b>	117	5.8%
<b>Massachusetts</b>	79	3.9%
<b>Florida</b>	74	3.7%
<b>Illinois</b>	69	3.4%
<b>Oregon</b>	64	3.2%
<b>Pennsylvania</b>	50	2.5%
<b>All States</b>	<b>2,013</b>	<b>100%</b>

Source: [www.gamasutra.com](http://www.gamasutra.com); Godbe Research, 2006.

It should be noted that, in addition to game development and publishing companies, the *Gamasutra* directory also includes organizations that may have only a tentative link to the video and computer game industry, such as recruitment agencies, law firms, finance companies, and marketing or PR firms. A further analysis of the directory was carried out, focusing on the segments most directly linked to the industry. *Table C2* indicates that around a third of the US companies listed were based in California for each of the industry segment groups analyzed.

*Table C2: California-Based Companies by Industry Segment*

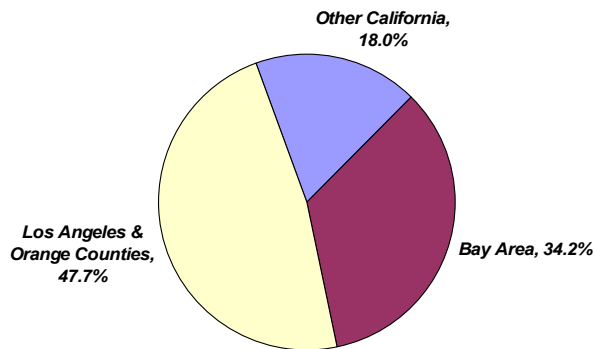
<b>Industry Segment</b>	<b>Number of US Companies Listed</b>	<b>Proportion of Companies in California</b>
<b>Game Development</b>	609	36.0%
<b>General Programming</b>	389	34.7%
<b>General Game Design</b>	448	34.4%
<b>General Game Production</b>	348	34.2%
<b>Level Design</b>	323	33.1%
<b>Game Publishing</b>	121	32.2%

Source: [www.gamasutra.com](http://www.gamasutra.com); Godbe Research, 2006.

## Locations of Video and Computer Game Companies in California

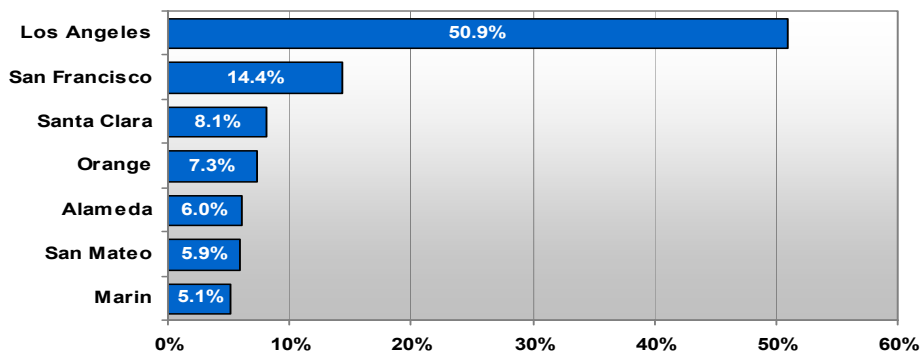
A further analysis of the *Gamasutra* company directory was carried out to investigate the locations of video and computer game companies within California. *Figure 1* below shows that almost half the companies were based in the Los Angeles and Orange County region (48%), while a further 34 percent were located in the 10-county Bay Area region. By comparison, less than a fifth (18%) of California companies listed on the *Gamasutra* company directory were located outside of the two regions covered by this study. The other California regions which had a comparatively high number of video and computer game companies included San Diego County and Ventura County.

Figure 1: Locations of California Companies by Region



The *Figure 2* below provides a breakdown of video and computer game company locations listed on the *Gamasutra* website by county within the two-region area covered by the study. The figure indicates that just over half (51%) were located in Los Angeles County, while San Francisco County was home to the second-highest proportion of companies (14%).

Figure 2: Locations of California Companies by County



## Industry Employment Estimates

Due to the fact that the video and computer game industry is not clearly defined or classified, estimating the level of employment in the industry is particularly difficult, and to date, no substantive studies have been carried out in this field. According to a Coopers and Lybrand<sup>3</sup> study for the Interactive Software Developers Association (now the Entertainment Software Association), there were around 50,000 direct employees working in video game development in the US in 1998, while the latest estimates suggest that consumer expenditures on entertainment software supported around 144,000 full-time workers in 2004 (see Table C3).

Table C3: Industry Employment Estimates by Segment in 2004

<b>Industry Segment</b>	<b>Expenditure \$m</b>	<b>Job Creation*</b>	<b>Market Proportion 2004</b>	<b>Expected Market Proportion 2008</b>
<b>PC Software</b>	1,058	18,615	13%	6%
<b>Console Games</b>	6,212	109,300	76%	41%
<b>Online Games</b>	647	11,383	8%	28%
<b>Wireless Games</b>	281	4,944	3%	25%
<b>Total</b>	<b>8,198</b>	<b>144,242</b>	<b>100%</b>	<b>100%</b>

\* Based on the US Dept of Commerce Bureau of Economic Analysis job multiplier for the software publishing industry (17.595 jobs per million dollars of software sales).

Source: Pricewaterhouse Coopers, 2004.

<sup>3</sup> Now known as Pricewaterhouse Coopers

## Appendix D: Career Path Information

The International Game Developers Association (IGDA) has provided information on career paths titled "Breaking In." The paths are outlined below, but additional information can be accessed at their site: <http://www.igda.org/breakingin/>.

<b>Area</b>	<b>Occupations</b>	<b>Comments on entry-level jobs</b>
<b>Audio</b>	<input type="checkbox"/> Sound Engineer/Designer <input type="checkbox"/> Composer/Musician <input type="checkbox"/> Audio Programmer/Engineer	Generate games sound effects, compose music, write software to support sound
<b>Production</b>	<input type="checkbox"/> Producer/Project Lead <input type="checkbox"/> Project Manager <input type="checkbox"/> Associate Producer <input type="checkbox"/> Game Tester <input type="checkbox"/> Lead Tester	Game tester detects bugs and reports to programmers. Lead tester supervises all testers and often trains them.
<b>Visual Arts</b>	<input type="checkbox"/> Intern Artist <input type="checkbox"/> 3D Model Builder (Objects) <input type="checkbox"/> 2D Conceptual Artist <input type="checkbox"/> 2D Texture Artist <input type="checkbox"/> 3D Cutscene Artist <input type="checkbox"/> 3D Character Builder <input type="checkbox"/> 3D Character Animator <input type="checkbox"/> Level Builder <input type="checkbox"/> Art Director <input type="checkbox"/> Art Technician	Appears to be a lot of cross-over here with the skills needed to be a multi-media artist and animator, although there are some unique software packages that artists in this industry need to be familiar with.
<b>Programming</b>	<input type="checkbox"/> Junior Programmer <input type="checkbox"/> Lead Programmer <input type="checkbox"/> Engine/Tools Programmer <input type="checkbox"/> AI Programmer <input type="checkbox"/> Multiplayer Networking Programmer <input type="checkbox"/> Technical Director <input type="checkbox"/> Network Engineer <input type="checkbox"/> Hardware Engineer	Code is the core stuff of games. 3D graphics programming is a must. Also helpful are: AI, 3D math, physics, sound programming, collision systems, game design theory. C/C++ seems to be a very common program used in the industry.
<b>Design</b>	<input type="checkbox"/> Game Designer <input type="checkbox"/> Lead Designer <input type="checkbox"/> Level Designer <input type="checkbox"/> Fiction Writer/Screenwriter	Level designers build the interactive architecture for a segment of the game. Screenwriter creates the backstory, writes character dialogue.
<b>Biz &amp; Misc.</b>	<input type="checkbox"/> Support staff <input type="checkbox"/> Human Resource Managers <input type="checkbox"/> Managers <input type="checkbox"/> Marketing/PR <input type="checkbox"/> Sales <input type="checkbox"/> Systems Administrators <input type="checkbox"/> Accounting/Business <input type="checkbox"/> Legal Staff (Content Acquisition/Licensing)	

## Industry Salary Survey

*Game Developer Magazine* published the 4<sup>th</sup> Annual Salary Survey that ranks average salaries of those employed in California's Video and Computer Game Industry at \$76,759 - \$5,000 higher than last year's survey and by far exceeding California's overall annual average pay of \$41,419.

Findings from the survey:

<b>Average Salaries Based on years of Experience</b>	<b>&lt; 3 Years Experience</b>	<b>3-6 Years Experience</b>	<b>&gt; 6 Years Experience</b>
<b>Programmers and Technical Directors</b>	\$56,000-\$63,000	\$68,000-\$77,000	\$86,000-\$115,000
<b>Artists and Animators</b>	\$42,000-\$64,000	\$56,000-\$62,000	\$64,000-\$78,000
<b>Designers and Creative Directors</b>	\$43,000-\$44,000	\$51,000-\$52,000	\$67,000-\$78,000
<b>Producers and Project Leads</b>	\$52,000	\$60,000-\$79,000	\$82,000-\$118,000
<b>Testers and QA Leads</b>	\$33,000-\$43,000	\$33,000-\$38,000	\$48,000-\$60,000
<b>Audio Designers/Engineers and Composers/Musicians</b>	\$64,000-\$68,000	\$51,000-\$56,000	\$73,000-\$92,000
<b>Business and Legal including Marketing, PR, Sales, Executives, and other Staff</b>	\$60,000-\$76,000	\$56,000-\$93,000	\$83,000-\$113,000

Additional to base wages, most employees in the industry benefit from additional types of compensation such as: annual bonuses, project bonuses, royalties, stock options, and profit sharing.

## **Appendix E: Occupational Profiles Report**

Video and computer game occupations have been grouped into the following functions:

- Game Design
- Art
- Programming
- Production
- Testing

The Occupational Profiles Report discusses occupations within these five functions and addresses the following areas:

- Current Employment
- Projected Employment
- Occupational Shortage Indicators
- Entry-Level Job Titles
- Entry-Level Education Requirements
- Entry-Level Work Experience
- Entry-Level Skill Requirements
- Entry-Level Skill Deficiencies
- Wage Levels

A copy of the Occupational Profiles Report is available at: <http://cccwd.net/resource.cfm?i=8>

## Appendix F: Education and Training Providers

Name	Location	Programs	Degree / Certification	Tuition	Program Length	Phone
3D Exchange	Alameda	Computer Animation – LightWave 3D	Certificate		Varies	
3D-Online	Los Angeles	Introduction to 3D Graphics Programming, Game Engine Fundamentals, Game Development and 3D Web and Wireless Devices	Certificate	Varies	6-10 week courses	(310) 406-1169
Academy of Art University	San Francisco	Computer Arts (Game Design, 3D Modeling, 2D and 3D Animation, New Media, Web Design, Visual Effects)	AA BFA MFA Online Programs	\$550 per credit (U) \$600 per credit (G)	4 years (BFA) 2 years (MFA) 3 years (certificate)	(800) 544-2787
Academy of Game Entertainment Technology	Hollywood	Level Design, Programming, Animation, QA Testing	Certificate	\$1,100 per course, full-time prepaid per quarter	6-9 months	(323) 466-4300
Art Center College of Design	Pasadena	Product Design, Environmental Design, Graphic Design, Illustration	BFA BS	\$12,400 per semester	8 semesters	(626) 396-2373
Art Institute of California – Los Angeles	Santa Monica	Game Art & Design	BS	\$75,556 full tuition inc. fees	12 quarters	(888) 646-4610 (310) 752-4700
Art Institute of California – Orange County	Santa Ana	Media Arts & Animation, Graphic Design, Game Art & Design, Multimedia & Web Design	AA BFA BA BS	\$75,786 full tuition inc. fees	7 quarters (AS) 12 quarters (BS)	(888) 549-3055 (714) 830-0200
Art Institute of California – San Francisco	San Francisco	Game Art & Design, Media Arts & Animation, Visual & Game Programming	BS	\$383 per credit hour or \$6,112 per quarter	12 quarters	(415) 865-0198 (888) 493-3261
Audio Institute of America	San Francisco	Recording Engineering/ Production	Diploma			(415) 752-0701
Berkeley City College	Berkeley	Digital Imaging, Digital Video Arts	Degree Certificate		2 years – degree; certificate varies	(510) 981-2800

Name	Location	Programs	Degree / Certification	Tuition	Program Length	Phone
Brooks College	Long Beach Sunnyvale	Animation, Graphic Design, Multimedia, Network Technology	AS		2 years	(562) 597-661 (408) 719-0722
California Institute of the Arts	Valencia	Character Animation, Experimental Animation	BFA MFA	\$23,920 per year	4 years (BFA) 3 years (MFA)	(661) 255-1050
California State University, Fullerton	Fullerton	Entertainment Art / Animation	BFA	\$1,258 per semester (U) \$1,363 per semester (G)	4-5 years	(714) 278-3471
California State University, Long Beach (University College & Extension Services)	Long Beach	3DS Max Online	Certificate	\$1,295	40 hours	(800) 963-2250
Canada College	Redwood City	3D Animation & Video Game Art	Certificate			(650) 306-3330
Cerro Coso College	Ridgecrest	Serious Game Design (Online)	AS	\$216 (R) or \$2,004 (N)	12 months	<a href="mailto:jkiggens@cerro-coso.edu">jkiggens@cerro-coso.edu</a>
City College of San Francisco	San Francisco	Multimedia Studies: Concentration in Animation, Image and Sound, or Multimedia Programming	Certificate		Varies	(415) 452-5107
Cogswell Polytechnical College	Sunnyvale	Computer & Video Imaging, Digital Motion Picture, Digital Audio Technology, Digital Arts Engineering, Electrical Engineering, Software Engineering	BA BS	\$570 per unit \$1,710 per 3- unit class \$6,840 per full- time trimester	3-4 years	(800) 264-7985
College of the Canyons	Valencia	Animation Production, Computer Animation	AA Certificate			(661) 362-5039
College of Marin	Marin	Multimedia Studies, Visual Design Specialty	Degree Certificate		2 years	(415) 883-2211 ext.8255
Core Microsystems	San Jose	Adobe and Discreet certified software training workshops				(800) 886-2752

<b>Name</b>	<b>Location</b>	<b>Programs</b>	<b>Degree / Certification</b>	<b>Tuition</b>	<b>Program Length</b>	<b>Phone</b>
DeVry University – California	Fremont	Game and Simulation Programming	BS	\$640 per credit	8 terms	(888) 201-9941
DH Institute of Media Arts	Los Angeles	Autodesk / Discreet Certification	Certificate	\$950 - \$10,250	Varies	(310) 899-9377
Diablo Valley College	Pleasant Hill	Multimedia: Specialization in Character Animation, Digital Audio, or 3D Modeling and Animation	Degree		2 years	(925) 685-1230
Ex'pression College for Digital Arts	Emeryville	Digital Art Animation, Interactive Game Audio, Modeling, Game Production, Motion Studies	BA	\$54,450 (4 academic year program)	31 months	(877) 833-8800
Glendale Community College	Glendale	Digital Animation	Certificate			(818) 240-1000
Gnomon School of Visual Effects	Hollywood	High-End 3D Computer Graphics	Certificate	\$43,225 (certificate program). Extension courses vary from \$225 - \$1,700	21 months	(323) 466-6663
Golden West College	Huntington Beach	Game Development (State approval pending)	Certificate			(714) 892-7711
Grossmont College	San Diego	Introduction to Video Game Development	Courses	\$26 per course		(619) 644-7000
International Technology University	Sunnyvale	Python Programming, Java Programming, Unix Network Programming				(408) 331-1014
Los Angeles Mission College	Sylmar	Multimedia Studies	AA Certificate	\$26 per unit		(818) 364-7771
Ohlone College	Fremont	Video Game Development	Certificate			(510) 979-7965
Otis College of Art and Design	Los Angeles	Digital Media	BFA	\$11,410 per semester	4 years	(310) 665-6987
Palomar College	San Marcos	Programming & Software Skills	Courses	\$26 per course		(760) 744-1150
Pasadena City College	Pasadena	Interactive Multimedia Design	Certificate			(626) 585-7632
Platt College	Los Angeles Huntington Beach	Multimedia				(310) 568-5688 (714) 373-3240

Name	Location	Programs	Degree / Certification	Tuition	Program Length	Phone
Rio Hondo College	Whittier	Video Game Design & Development (Online)	Certificate	\$2,795	500 hours	(562) 463-4606
Saddleback College	Mission Viejo	Introduction & Design of Computer Games	Course			(949) 582-4500
San Francisco State University	San Francisco	Introduction to Computer Science via Game Design	BS MS	\$1,564 per semester @	4 years	(415) 338-1008
San Jacinto College	San Jacinto	Game Design Overview	Course			(951) 487-6752
San Jose State University	San Jose	Animation/Illustration	BFA			(408) 924-4320
Santa Ana College	Santa Ana	3D Animation	Certificate			(714) 564-5760
Santa Monica College, Academy of Entertainment & Technology	Santa Monica	Animation, Game Development, Post Production, Visual Effects, Web Design	AA Certificate	\$26 per unit \$149 - \$171 (N, I)	2 years	(310) 434-3700
Studio Arts	Los Angeles	3D Animation, Visual Effects		\$1,000 - \$1,500 per course		(323) 227-8776
University of California, Irvine	Irvine	Specialization in Game Culture and Technology, Computer Engineering, Information & Computer Science, Digital Arts	BA	Standard UC tuition costs apply	2-4 years	(949) 824-6703
University of California, Los Angeles (Extension)	Los Angeles	Computer Graphics & Graphic Design	Certificate	\$475 - \$855 per course	2 years	(310) 206-1422
University of Southern California, School of Cinema-Television, Interactive Media	Los Angeles	Interactive Entertainment, Interactive Media (includes EA Interactive Entertainment Track), Video Game Design and Management	BA MFA minor	\$1,074 per unit (G) \$14,994 per semester (U)	4 years (BA) 3 years (MFA)	(213) 821-2515
West Valley College	Saratoga	Computer Arts & Animation	AA Certificate			(408) 867-2200
Westwood College	Anaheim Los Angeles	Game Software Development, Game Art & Design	BS			(714) 704-2721 (213) 739-9999

Sources: Game Developer Magazine Career Guide 2004; Gamasutra School Finder; California Community Colleges.

## **Legend**

G – Graduate Program  
I – International Students  
R – State Residents  
N – Non-state Residents  
U – Undergraduate Program  
AA – Associate of Arts

BA – Bachelor of Arts  
BFA – Bachelor of Fine Arts  
BS – Bachelor of Science  
MA – Master of Arts  
MFA – Master of Fine Arts  
MS – Master of Science

## Appendix G: Key Industry Organizations

### **International Game Developers Association (IGDA)**

870 Market Street, Suite 1181  
San Francisco  
CA 94102-3002  
Phone: (415) 738-2104  
Fax: (415) 738-2178  
Email: [info@igda.org](mailto:info@igda.org)  
Website: [www.igda.org](http://www.igda.org)

### **Entertainment Software Association (ESA)**

575 7th Street, NW  
Suite 300  
Washington, DC 20004  
Email: [esa@theesa.com](mailto:esa@theesa.com)  
Website: [www.theesa.com](http://www.theesa.com)

### **Entertainment Software Rating Board (ESRB)**

317 Madison Avenue, 22<sup>nd</sup> Floor  
New York, NY 10017  
Website: [www.esrb.org](http://www.esrb.org)

### **The Academy of Interactive Arts and Sciences (AIAS)**

23622 Calabasas Road, Suite 220  
Calabasas, CA 91302  
Phone: (818) 876-0826  
Fax: (818) 876-0850  
Website: [www.interactive.org](http://www.interactive.org)

## **Appendix H: References**

- California Regional Economies Project: Southern California Economic Base Report California State EDD LMID ([www.calmis.ca.gov](http://www.calmis.ca.gov))
- Digital Broadband Content: The Online Computer and Video Game Industry – OECD, 2005.
- Digital Distribution & Interactive Entertainment: A Labor Market Analysis and Sectoral Workforce Development Strategies Prepared for The City of Los Angeles Workforce Investment Board by Entertainment Industry Development Corporation (EIDC) and The PMR Group, Inc., June 2002
- Essential Facts about the Computer and Video Game Industry, Entertainment Software Association
- Gamasutra.com
- Game Developer Magazine Career Guide 2004
- Game Developer Magazine’s 4th Annual Survey Salary
- Godbe Research, Video and Computer Workforce Study, July 2006
- International Game Developers Association (IGDA.org) “Breaking In”
- International Game Developers Association 2005 Mobile Games White Paper presented at the Game Developers Conference 2005 by the IGDA Online Games SIG
- Multimedia Entertainment Initiative, California Community Colleges Economic and Workforce Development Program
- Roadmap to Industry Clusters (2004) Los Angeles County Economic Development Corporation)