CALIFORNIA COMMUNITY COLLEGES
ECONOMIC & WORKFORCE DEVELOPMENT PROGRAM

BUSINESS AND WORKFORCE PERFORMANCE IMPROVEMENT INITIATIVE

Industry Scan Report
Los Angeles County

Entertainment
"Overview with an Emphasis on Technology"

Prepared By:
Center of Excellence, Region 7
Hosted at the Los Angeles Community College District

August 31, 2005

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Strategic Opportunities for Community Colleges in Entertainment

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VIDEO INFOTAINMENT WILL RISE FROM $76 MILLION THIS YEAR TO $1.6 BILLION IN 2010[1]

Executive Summary

One of Southern California's key economic clusters is the Visual Entertainment Industry. It is composed of those firms involved in the production, post-production, distribution, and visual effects and animation, in the making of motion pictures, television programs, music videos and computer games. Technical Support Services also plays a vital role in the industry and impacts all four of the aforementioned segments. The visual entertainment industry is a sector in which Los Angeles County has maintained its competitive share (*82.3% of California jobs*) due to the concentration of the industry's most important firms and a highly skilled knowledgeable workforce.

Opportunities exist for the colleges to expand existing programs, integrate entrepreneurial and additional soft-skills training into curricula, and provide enhanced instruction regarding how the industry works. There is also a lack of understanding regarding the breadth of occupations and opportunities to those interested in entering the field.

The nature of project-based employment within the industry is an important consideration when developing programs. Due to this being the primary way that the industry operates, workers must be entrepreneurial and have extensive social networks. They frequently find jobs through referrals. There are some intrinsic traits identified in workers successful in this industry. The colleges can assist students in learning if it is a good fit for them.

This is a complex industry and while potential opportunities deserving further exploration are touched upon, this report attempts to provide an overview of industry concerns and needs, while maintaining emphasis on occupations within the industry utilizing technology, which are projected to grow in Los Angeles County. Many of these growing occupations are identified in numerous additional industries, potentially enabling those who are trained in these areas to be marketable across industries.

Lead workers in the various occupations of the sector almost always require at least a bachelor's degree level of training to stay at the forefront of technology. However, they can be supported by technicians with less than four-year degrees, provided they are well trained and have a solid understanding of the technologies they are using.

One area in need of further exploration is within the area of digital cameras. This technology is widespread within the industry and growing. There are presently an insufficient number of technicians who know how to accurately operate and maintain digital equipment. Manufacturers usually provide training on equipment as well as software, but it is typically not enough to bring workers up to speed with the products. These are

[1] Strategy Analytics, August 2005

areas where community colleges could strengthen existing programs and provide a valuable service to students and the industry. Proprietary schools often provide these types of courses but they can range upward of $3,000 for a three-day course.

The rapid pace of evolving technology impacts the industry in multiple ways. Not only are the areas of high definition and digitalization factors, increasingly, there is an emphasis on cell phone content. This is becoming a reality and it is projected that the North American market for mobile content will likely reach 14 billion by 2008.[2] As highlighted above, video Infotainment will rise from $76 million this year to $1.6 billion in 2010.

Students interested in the sector should understand that it is a highly competitive one in which they will face a good deal of competition for jobs. One reason for this extensive competition stems from the fact that the sector is subject to intensive booms and busts. Another, is the result of the project-based organization of work in which teams are formed to produce a movie, television program, music video or video game and then disperse as soon as the project is over. This means that a worker's ability to have continuous work will depend on their abilities, their contacts and social network, and their ability to find jobs outside of the industry that also require their skills.

It should be noted that whether a student works in the Visual Entertainment Industry or not, the training they receive in preparing for the technology related jobs identified in the following pages will assist them in winning well-paying technology jobs in a wide range of industry sectors.

This report is closely connected to a recent study conducted in partnership with the Multimedia Entertainment Initiative by the Entertainment Economy Institute, in which 32 occupations within the Entertainment Industry were identified as "technology occupations." Given the project-based nature of the industry, the idea that workers may have skills that enable them to additionally work in other industries was explored. If these occupations could be identified and validated with the industry, the colleges would have a better understanding of how to best prepare students for the industry, while also guiding them to be marketable across industries. Thus, it was discovered that there are at least 32 technology related jobs within the industry which reveal the potential to have equivalents in other sectors, and workers with these skills are well compensated in and out of the industry allowing them to be essentially "cross-trained."

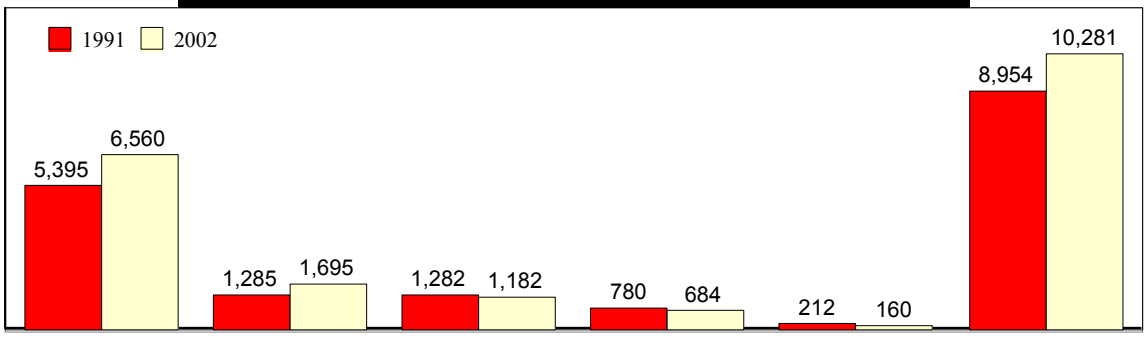
[2] Strategy Analytics, June 2005.

Overview of the Strategic Opportunity

Since its inception, the Visual Entertainment industry has been concentrated in Los Angeles County (*64% of firms in California, Exhibit 1*) and has been a key component of the county's economic base. Over the years, the sector's composition has changed dramatically. Initially, it was made up of firms making motion pictures. Later, television production was added. More recently, the creation of music videos on DVD became an important segment. The industry has now morphed again to include companies producing video & computer games. Cell phone content is also becoming a driver; Sprint and Cingular now offer television service that brings entertainment and news content to cell phone users.

People working in the Visual Entertainment industry can be roughly divided among those dealing with production, post-production, visual and special effects, and distribution of its products. Their skills can be broken into four categories: camera and film editing; sound and sound editing; lighting; and computer effects (*with the addition of computer programming for video & computer games*).

Exhibit 1.-Geographic Location of Firms, California Visual Entertainment Industry, 1991 & 2002



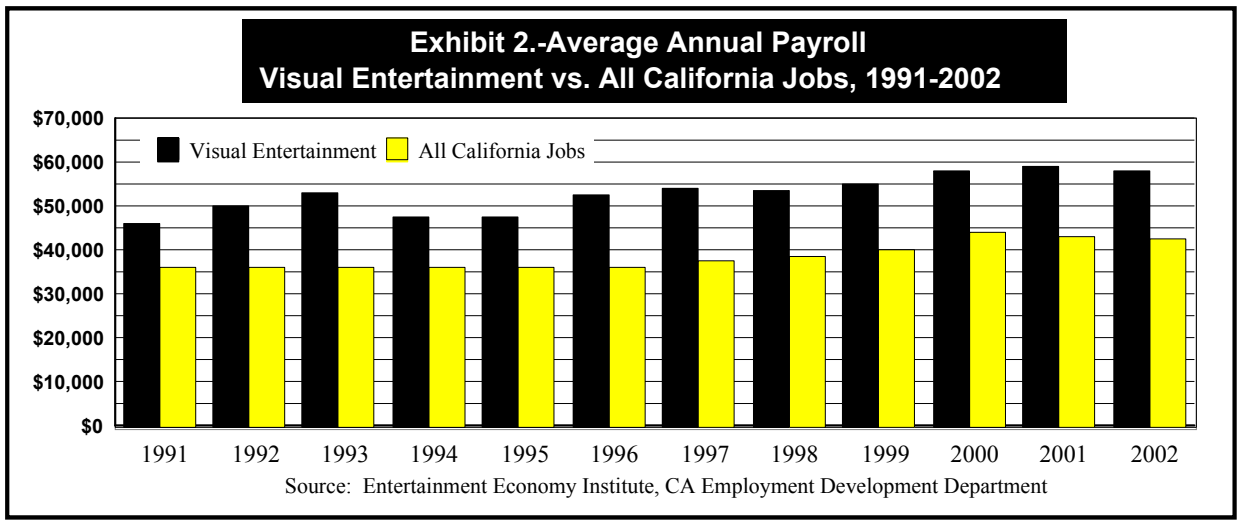
Source: Entertainment Economy Institute

For those interested in working in the field, the Visual Entertainment industry offers interesting opportunities and challenges. One is the very fact that technology is constantly allowing the alteration of the definition of what constitutes the industry (*motion picture, television, music videos, gaming*). As the sector's customers spend discretionary income on its products (*money above that for required expenses*), the sector's employment tends to parallel the business cycle, but its peaks and valleys are more extreme (*Exhibit 5 later*).

Heightening the instability of jobs in the industry is its project-based organization, whereby teams of individuals and companies are brought together to work intensively

on a movie, television show, DVD or game, and then disperse.[3] It is important to note that students will need to possess strong entrepreneurial skills in order to market themselves and negotiate deals. They must also have strong communication skills.

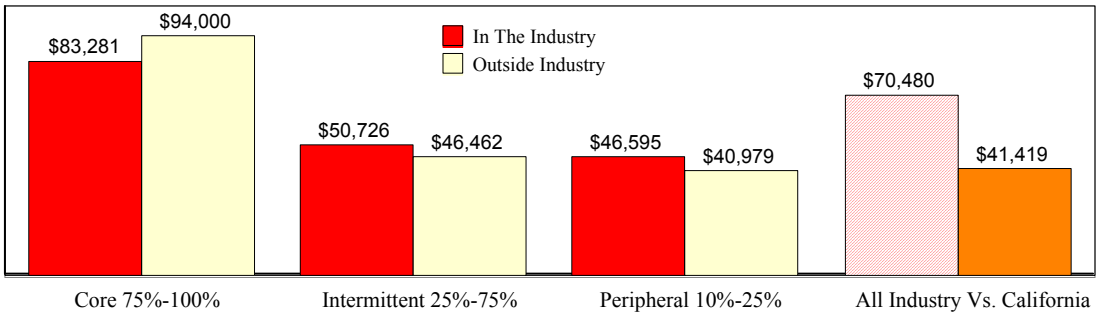
Workers are apparently willing to accept lack of job security for pay levels that have remained well above the state's average pay per job (*Exhibit 2: 70.2% higher in 2002*). Because of project-based production, the industry's workforce is divided between "core workers" who work 75%-100% in the Visual Entertainment industry; "intermittent workers" (*e.g., 3D computer technicians*) who regularly spend 25%-75% of their time in the industry and the rest of their time working in unrelated sectors; and "peripheral workers" who work 10%-25% of their time in the industry and the remainder working elsewhere.[4] Note that for each of the categories, the average annual pay while working in the industry exceeds the state's annual average pay of $41,419. Additionally, workers who possess a highly specialized skill set in the "core worker" category can earn an even higher wage when they are employed using those specialized skills outside of the industry (*Exhibit 3*).



[3]Entertainment Economy Institute, Crossworking: High-Tech Motion Picture and Television Workers in California -Exploring Employment Patterns and Industry Cross-over Opportunities, 2005.

[4] Entertainment Economy Institute, (2004). California's Entertainment Workforce: Employment and Earnings, 1991-2002.

Exhibit 3.-Core, Intermittant & Peripheral Entertainment Workers Industry Vs. Non-Industry Average Annual Pay, California, 2002



Source: Entertainment Economy Institute

Description. Interviews with executives in the Visual Entertainment Industry indicate that the community colleges have a strategic opportunity to expand offerings via certificates, specialized training, and degree programs that can help workers enter one of what the Los Angeles Economic Development Corporation considers to be Los Angeles County's key economic drivers.[5] However, they stress that competition for jobs in the industry is intense because of its high profile and above average pay for most positions. Also, the short-term project-based nature of most of the sector's work means that potential workers must be prepared to live with a significant amount of job instability. Students interested in the field must understand that numerous entertainment workers also have jobs in non-entertainment sectors requiring the same or similar skills. This may present an opportunity to cross-train students so that they may be marketable in multiple industries. It is also important to note that this contributes to the strong entrepreneurial nature of the industry and individuals entering the field must be aware of this, as well as the need to develop strong social networks.

There are essentially three levels of training in which the community colleges can participate. The first two represent course work that could ultimately lead to a bachelor's degree. In the first level of training, students will need to complete a four-year degree before starting work. The community colleges can provide the first two years of these programs. This applies to 14 occupations that will account for 16,900 jobs in California's Visual Entertainment Industry by 2012 and 550,600 in the overall state economy. Average starting pay in these sectors for Los Angeles County was $51,060 in 2004. The median pay was $76,016. Experienced workers averaged $94,795.

In the second case, with appropriate preparation, students can enter the industry with less than a four-year degree and work in jobs that pay very well, or they can continue on to 4-year colleges after completing their community college work and enter these career fields at that time. This applies to 13 occupations that will account for 28,200 jobs in California's Visual Entertainment Industry by 2012 and 299,500 in the overall state economy. Average starting pay in these sectors in Los Angeles County was $29,121 in 2004. Median pay was $45,939. Experienced workers averaged $66,488.

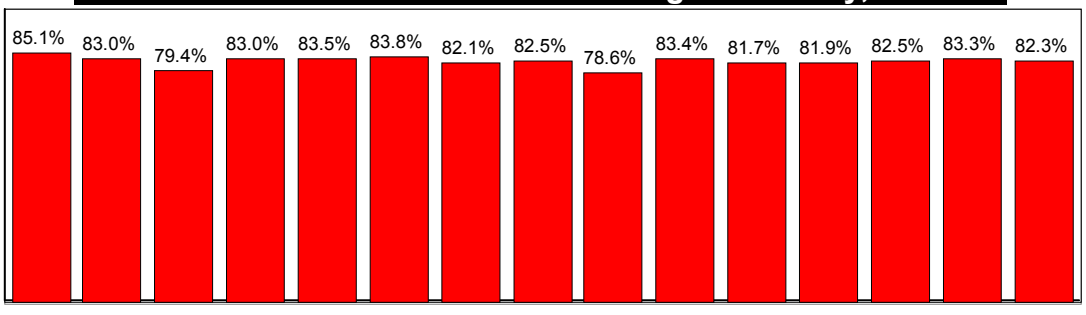
[5] Los Angeles Economic Development Corporation, Recapturing the Dream: A Winning Strategy for the LA Region, January 2005.

The third area is that of contract education or fee-based courses, as well as community service classes. These can provide alternative delivery formats and short-term courses focused on specialized training to assist workers acquire skills in new technologies or improve knowledge of the industry. An example would be in the area of digital cameras, which is expected to grow. Manufacturers provide limited training; proprietary schools offer programs but they can be cost prohibitive to many who need it. There are also new occupations emerging associated with the use of digital technologies. Two of these are Digital Image Technicians and Image Capture Technicians[6].

Overall, whether offered via fee-based courses or integrated into the curriculum for credit, students need to have a better understanding of how the industry works, the variety of occupations within it, and most likely, strong entrepreneurial skills.

Where Opportunity Exists. The Visual Entertainment Industry operates throughout California (*Exhibit 1, earlier*). However, within it, the motion picture and sound industry is heavily concentrated in Los Angeles County. This is where the industry began and it remains its economic center. From 1990-2004, the California Economic Development Department (*EDD*) found the county's share of employment in the motion picture and sound industries went from 85.1% to 82.3% with minor fluctuations (*Exhibit 4*).

Exhibit 4.-Motion Picture & Sound Industry Jobs Share of California Jobs In Los Angeles county,



Source: CA Employment Development Department

Demand. Ultimately, the basis for employment demand within the Visual Entertainment Industry is derived from worldwide demand for motion pictures, television programs, music videos, and video/computer games. The production of these products has centered in Los Angeles County because this is where the industry began with early motion picture production. The area has maintained a competitive edge in production because the major studios are here (*Disney, MGM, Paramount, Sony, Twentieth Century Fox, Universal, Warner Bros.*). A key issue has been the value of the U.S. dollar versus the Canadian dollar. When the Canadian dollar is worth less, it is attractive for U.S. financed production to take place in Canada. This exchange rate has recently moved in favor of keeping production in the U.S. Southern California has kept an edge in post-production, DVD production, and engineering because of the network of 6,560 small

[6] Entertainment Economy Institute, Cross-working: High-Tech Motion Picture and Television Workers in California –Exploring Employment Patterns and Industry Cross-over Opportunities, 2005.

technologically sophisticated companies (*most have under 20 employees*) that form the county's Visual Entertainment cluster. They are supported by the area's strong four-year colleges (*e.g., USC, UCLA, Cal Tech*).

Within Southern California's Visual Entertainment Industry, skills can be broken into four categories:

- **Production.** These are the camera, lighting and sound functions involved in filming motion pictures, television programs, music videos or video games.
- **Post Production.** These are the film editing; sound editing and mixing; and visual and computerized effects that occur after production is finished.
- **Distribution.** These are the functions involved in moving the film, television show, music video or video game on to media such as DVDs.
- **Visual Effects and Animation.** Functions include creating computer-generated images and characters that are integrated into feature films and television programs once the principle photography process has ended.

Technical Support Services also plays a vital role in the industry and impacts all four of the aforementioned segments. These individuals operate, enhance, modify and maintain electronic equipment and computer systems, workstations and networks for the industry.

In each of the categories, the senior positions require people with bachelor's degrees (if not higher) training as well as industry experience. However, specialization means that below them are many technicians whose jobs do not immediately need a four-year degree. Such technicians work with film, cameras, lighting, sound, electronics and CAD-computer systems. To be in the senior group of people, workers can begin their education at a community college but must transfer to a four- year school to complete their degrees. The second tier of workers can take general education and specialized classes at a community college and start work. Later, they should be prepared to complete four-year degrees due to the increasing skills, and technological knowledge required to move up in the industry. Additionally, regardless of the tier, people can maintain their job skills as technology changes by taking specialized courses at community colleges if the courses are offered and scheduled to meet the needs of working professionals.

Value to Community Colleges. The community colleges can add value in the Visual Entertainment Industry by providing workers with courses qualifying them to begin work in the industry and, in some cases, provide job-advancement training. There are several areas where colleges could improve offerings to the industry, but further research and industry validation are needed to determine the size of the opportunities. These areas are:

- The extent of cross-working opportunities in the technology occupations identified.

- Training in specific technologies such as the areas of high definition, digital technology, and additional areas, which can be customized to meet industry demand.

General recommendations from industry include:

- Courses which integrate projects that will provide students with products upon completion, such as demo reels or publications.
- Soft skills training integrated into training in areas such as communication skills, problem-solving, entrepreneurial skills, negotiation.
- Partnerships with industry associations and unions that may provide resources such as "experts" for classroom presentations, faculty externship opportunities, and diversity programs to facilitate recruitment.
- Courses that provide an overview of the industry and how it works exploring the breadth of ancillary jobs in areas such as post production and distribution as well as how the industry operates.

- **Classes.** Along with strong educational fundamentals, students who pursue careers in technology related occupations within the industry need classes in the fundamental principles underlying the technologies with which they will be working. Fundamental technology courses in areas such as CAD, DVD, audio systems; video systems; broadcasting systems; lighting systems; digital and other camera systems provide the basis for more advanced instruction. Community colleges have historically taught fundamental entertainment technology courses.
- **Specific Occupational Skills.** As with any technological field, Visual Entertainment workers must come to their first job with a solid technological background. Every student must be proficient with computer systems. Most will need to have hands-on experience with increasingly sophisticated audio, video, and broadcasting equipment. Community colleges are adept at designing specialized courses of this type in conjunction with industry, but they must continually adapt and revise courses to keep up with the technological advances. High-end skills courses that are continually updated can be attractive, inexpensive alternatives to expensive proprietary school courses for working professionals.

Labor Market Projections. The California Employment Development Department (*EDD*) forecasts that there will be 45,100 technical jobs in the Visual Entertainment sector in California by 2012, not including performers. While EDD does not break these data down by occupation for Los Angeles County, total employment for the sector showed that 82.4% of its jobs and 64% of its firms are currently in Los Angeles County (*Exhibits 1 & 4, earlier*). EDD further indicates that virtually all of the jobs in the industry are also found in other sectors. People trained for them will thus be employable in a to-

tal of 175,000 jobs in the county by 2008 and 850,100 jobs in the state by 2012. These positions can be divided into two groups:

- In 2012, there would be 16,900 California jobs for which students could start their training in the community college but will ultimately need a bachelor's degree. They will also be qualified for a total of 97,000 jobs in Los Angeles County in these fields by 2008 and 550,600 jobs in California by 2012. Based upon average incomes for such positions in and out of the Visual Entertainment sector, entry- level average annual pay is $51,060 in Los Angeles County. With experience, this would go up to a median of $76,016. Experienced workers in these positions average $94,795. (*Note: Visual Entertainment pay likely exceeds these levels.*)
- In 2012, there will likely be 28,200 California positions for which people could enter after completing community college training. They will also be qualified for a total of 77,000 jobs in Los Angeles County in these fields by 2008 and 299,500 total jobs in California. Based upon averages, annual incomes for such entry-level positions in and out of the Visual Entertainment sector is currently $29,121 in Los Angeles County. With experience, this goes up to a median of $45,939. Experienced workers in these positions average $66,488. (*Note: Visual Entertainment pay likely exceeds these levels.*)

Exhibits 10 and 11 (later) provide projections for those occupations within the industry, which are expected to grow. These occupations are technology related occupations, which EDD projects to be the fastest growing for Southern California. While many may not seem entertainment industry specific, they are vital occupations to the industry, which is why they are included.

Industry Validation. In developing material for this strategic opportunity, discussions were held with executives involved in Los Angeles County's Visual Entertainment industry (*see list below*). In particular, the Entertainment Economy Institute, which specializes in research on the industry's labor force trends, was of great assistance.

Source Data. This report has utilized information and insights from the following individuals, organizations, and associations:

- California's Entertainment Workforce: Employment Earnings 1991-2002 Entertainment Economy Institute (EEI) Website: www.entertainmentecon.org
- Crossworking: High-Tech Motion Picture and Television Workers in California-Exploring Employment Patterns and Industry Cross-over Opportunities Entertainment Economy Institute (EEI) Website: www.entertainmentecon.org
- Economic Forecast & Industry Outlook For Five-County Los Angeles Area 2005-2006, Los Angeles Economic Development Corporation. Website: www.laedc.org
- Recapturing the Dream: A Winning Strategy for the LA Region, January2005. Los Angeles Economic Development Corporation. Website: www.laedc.org

- Southern California Association of Governments. Website: www.scag.ca.gov/ John Husing, Consultant. Website: www.johnhusing.com
- California Employment Development Department. Website: www.calmis.cahwnet.gov/
- ERISS job information and training requirement. Website: www.usworks.com/foothill
- Multimedia Entertainment Initiative of the California Community Colleges, Website: www.cccewd.net
- Interviews with industry executives, including:
    - Kathleen Milnes, President & CEO, Entertainment Economy Institute
    - Barbara McCullough, Manager of Recruitment Rhythm & Hues Studios
    - Bud Myrick, Digital Effects Supervisor, Rhythm & Hues Studios
    - Mitch Fishman, Render Support I/O Supervisor, Rhythm & Hues Studios
    - Peter Huang, Principal Software Engineer, Rhythm & Hues Studios
    - Shirley Craig, Partner, Weynand Training International
    - Timothy Hilman, Location Manager, Location Manager
    - Marino Pascal, President, Locationscout.com
    - Denny Clairmont, President, Clairmont Camera
    - Bob Eicholtz, Vice President, Corporate Development, Efilm
    - Maurice Ferkranus, General Manager, Deluxe Media Management

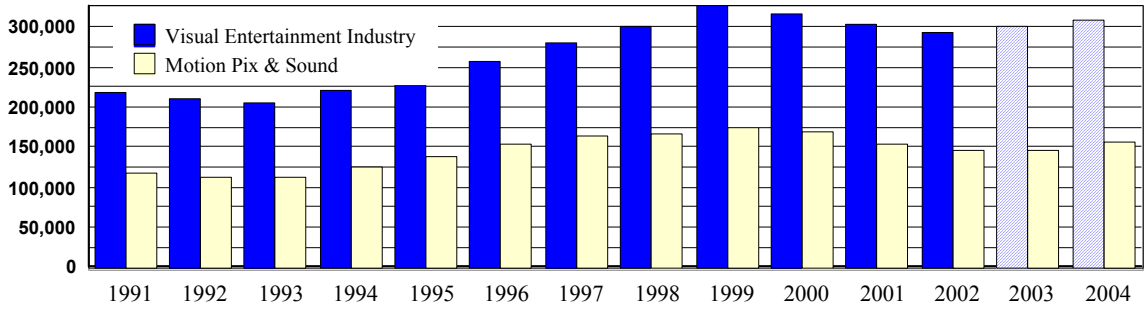
Industry Overview

State of the Industry. Within Los Angeles County, the growth of the Visual Entertainment Industry sector gives the community colleges the ability to use their workforce education efforts to expand the opportunity for students to enter a high technology field. As shown, it is an industry for which the county has been able to maintain a competitive advantage with 82.4% of the sector's jobs and 64% of its firms.

In looking at industry trends, the Entertainment Economy Institute (*EEI*) has compiled California-based data from 1991-2002 using confidential EDD and industry sources. These trends closely parallel those of EDD's publicly available data for the motion picture and sound sectors (*used in the Labor Market Projections*) but are much higher due to the inclusion of jobs in other parts of the economy. In 1991, EEI's information showed that California's Visual Entertainment sector had 218,000 jobs (*Exhibit 5*). By 2002, this was up to 294,000, a gain of 76,000 jobs or 35%. The growth occurred despite a decline from the high of 326,000 in 1999. This occurred because of the U.S. 2001-2002 downturn and the high value of the U.S. dollar versus Canadian dollar. That relationship had caused a lot of production to move north with fears that post-production work would follow. Both situations have now improved.

The EEI data did not extend to 2004, however, the narrower motion picture and sound studio job trend showed California employment that year at its highest level since 2000. Assuming the overall growth in the industry continued its parallel path, total Visual Entertainment Industry sector employment should have been back to about 308,000 jobs in 2004 (*up 41.6% or 90,600 jobs from 1991*).

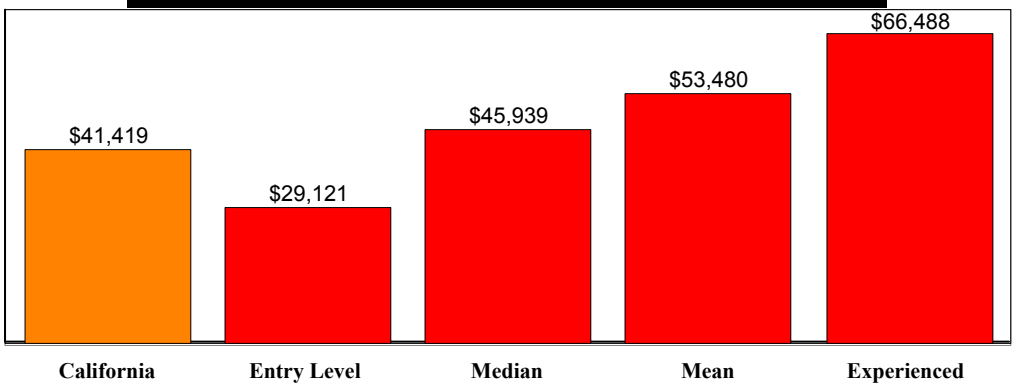
Exhibit 5.-Visual Entertainment vs. Motion Picture & Sound Jobs California, 1991-2004



Note: 2003-2004 Visual Entertainment data estimated based on Motion Pix & Sound trend
Source: Entertainment Economy Institute, CA Employment Development Department

For the expanded Visual Entertainment sector, EEI's data showed a pay scale average of $70,480 for all workers in the sector during 2002, well above California's average of $41,419 due to the technological nature of the sector. Core workers averaged $83,281 in the industry and $94,000 when working outside of it with the same skills. Intermittent workers average $50,726 in the industry and $46,462 outside of it. Peripheral workers averaged $46,595 in the industry. Their $40,979 pay outside of it was actually below California's average, showing the premium paid in the industry (*Exhibit 3, earlier*).

Exhibit 6.-Visual Entertainment Average Annual Pay Jobs For Which Community Colleges Can Train, 2004



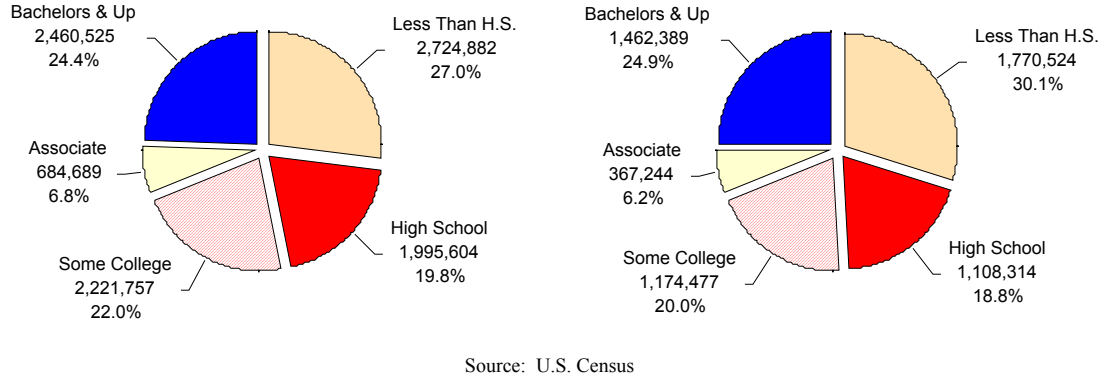
Source: California Employment Development Department

As indicated, within the Visual Entertainment Industry, there are many jobs that workers can hold without a bachelor's degree. These are the ones for which the community colleges can conduct the training. The mean pay for these jobs is $53,480 or 29.1%

higher than the state mean pay level (*$41,419*). The median is $45,939 and experienced workers in the field average $66,488. Entry-level workers start at $29,121 or $14.00 per hour (*Exhibit 6*). Also see exhibit 11 (later).

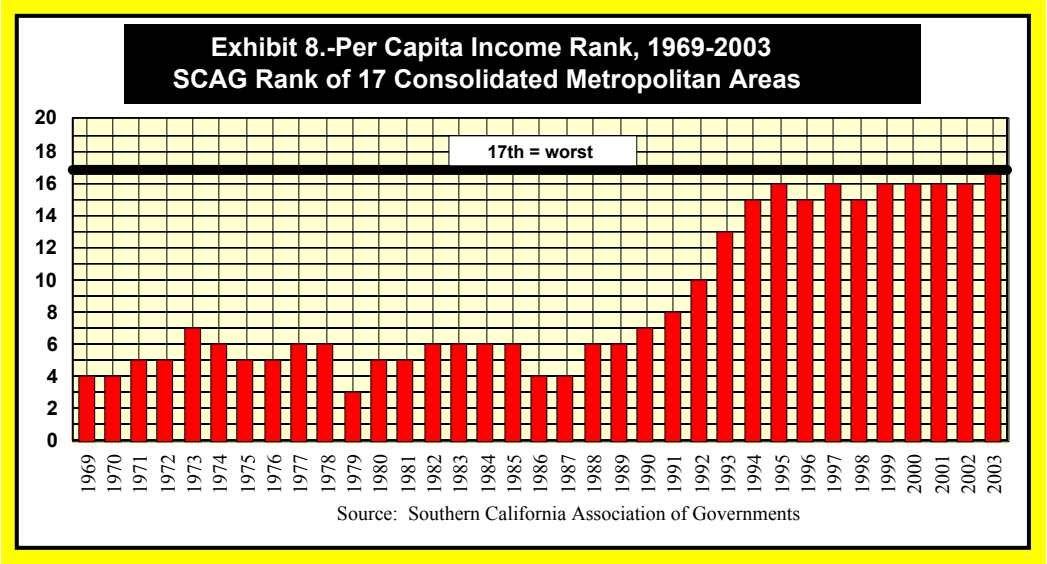
State of The Region. California's Community Colleges are the sole public educational vehicle that can provide training leading to upward income mobility for the very large share of adults who have not taken a single class beyond high school. In Los Angeles County, this situation is of particular importance as the 2000 Census found that 48.9% of people 25 years and older (2.8 million of the county's 5.9 million adults) fell into this category (*Exhibit 7*).

Exhibit 7.-Educational Attainment
SCAG Area & Los Angeles, 2000



Source: U.S. Census

Further, Los Angeles County is a key part of the 5-county Southern California Association of Governments (*SCAG*) region (*Los Angeles, Orange, Riverside, San Bernardino, Ventura*). SCAG has seen its per capita rank among the seventeen major U.S. multi-county areas fall from the fourth best (*1989*) to the 17th and worst (*2003*) (*Exhibit 8*). Given the increasing correlation between education and income, the deterioration in the status of the region's relative income rank is very likely related to the fact that in this wider area 46.8% of the population 25 years and older has not gone beyond high school (*Exhibit 7*).



Given these extraordinary challenges, in this study the attempt has been made to identify a key sector with which the community colleges can work to offer training that will give students the opportunity to enter a technologically sophisticated industry requiring skills that can provide them with life long rising incomes.

Key Associations Serving the Industry. There are a large number of associations serving the Visual Entertainment Industry. Fortunately, the Entertainment Economy Institute was established to work on the sector's labor force trends and training issues. This provided an excellent point of contact for research on training for the sector. An extensive list of specialized associations dealing with varying industry segments is listed in Appendix B. Many of these associations conduct diversity programs to recruit individuals of different cultural backgrounds into the entertainment industry. They also offer programs, which place faculty into entertainment companies to get first-hand experience, as well as provide expertise and guest speakers to classrooms.

Industry Workforce Challenges and Opportunities. The interviews conducted with executives in the Visual Entertainment industry for this report (*see Source Data above*), as well as research focused on the jobs within the sector, indicate that workers in the field are part of a cluster for which California has a significant technological edge. They will thus have fascinating careers and earn pay at levels far above the average for California and even above those in similar technological fields. However, to move up in the industry, they face a variety of challenges:

- **Basic Workforce Behavior.** The Visual Entertainment Industry is a highly competitive meritocracy. People are hired for defined projects. When the projects end, they must find new projects, or work in an alternate sector until a new opportunity arises. This creates two issues for workers. First, industry data show that the average entertainment worker will annually hold more than one job (*production workers: 2.3; intermittent workers: 1.7*). Second, the ability of a worker to find new work will likely depend upon "word-of-mouth" recommendations. Together, these characteristics define a sector that will not tolerate the casual atti-

tude about which employers often complain when discussing the lack of motivation by today's young labor force.

- **Basic Educational Foundation.** It is no secret that many students entering college do so with significant educational deficiencies. Thus, the Pacific Research Institute found:

  "In 2002, 59 percent of entering California State University (*CSU*) freshmen had to take remedial courses in English and/or math." (*Vol. 8, No. 32 August 14, 2003*)

  If this is a major issue for the CSU system that takes the top 33% of high school graduates, it is a bigger issue for community colleges that are accessible to virtually all students. However, the types of jobs in the Visual Entertainment Industry require students who are comfortable verbally, mathematically, and with computers. Students interested in working in the sector must be given the opportunity to overcome any such deficiencies or they will not succeed.

- **Background Course Work.** For students to truly succeed in a technology-enabled sector, they need to understand generally how the equipment and techniques they are using work. This means understanding the underlying physics applicable to these systems. Gaining that knowledge is not easy and will be a challenge to students in such programs. Electronic Technicians need to know algebra and calculus. Students need to understand why it is important for them to master these areas, as it is vital to their success as they move forward.

- **Specific Occupational Skills.** As with any technological field, Visual Entertainment workers must come to their first job with a solid technological background. Every student must be proficient with computer systems. Some may need a solid background in electronics. Those interested in most fields must learn to manipulate virtual images in 3 dimensions using MAC, CAD, or related systems. Others must learn to use and/or maintain sophisticated camera, sound, lighting, audio and digital editing and DVD systems.

Future Trends/Implications for Workforce Training. Southern California's economy faces two realities that make the expansion of a trained Visual Entertainment labor force an important consideration:

- One is the aforementioned (*Exhibit 7*) 48.9% of the region's workers who have not attended any higher education classes (*50.3% Los Angeles County*).

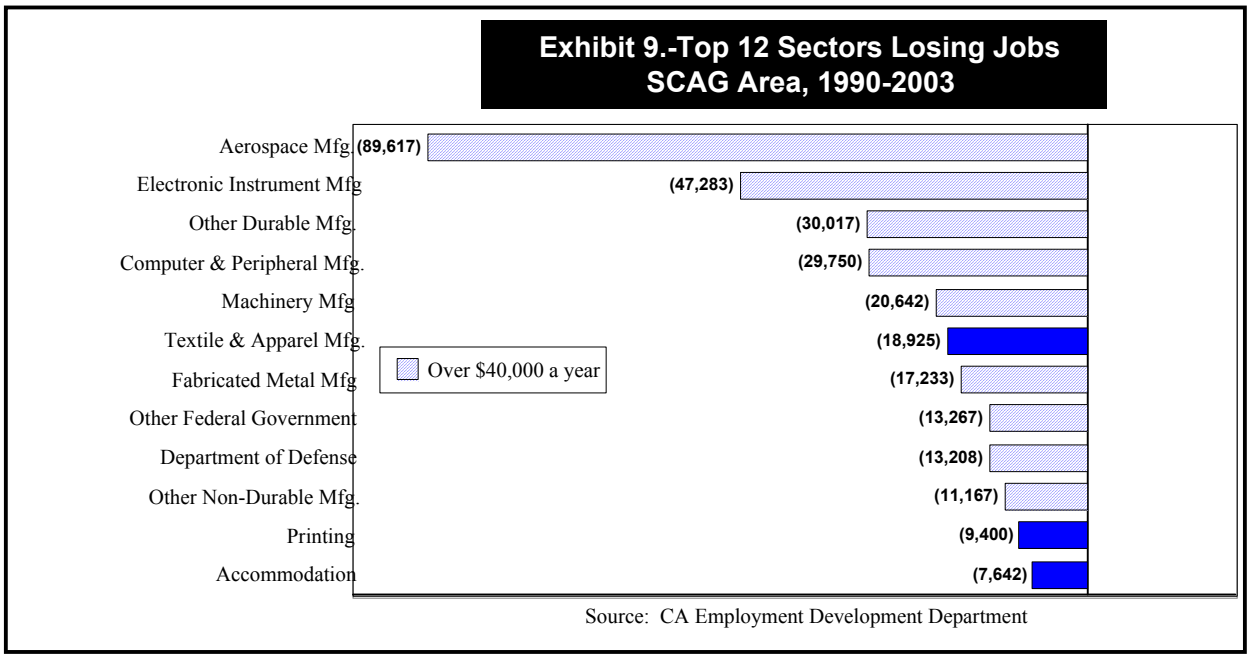
- The second is the demise of the manufacturing sector as a major growth force. From 1990-2003, most of the loss of jobs in Southern California came about due to reduction in this sector. It is one of the ramifications of California's high cost of doing business. It is also a side effect of the extraordinarily low cost of production in China where manufacturing wages range from $0.56 to $0.67 an hour.

Together, these realities mean that the success of Southern California's workers will increasingly depend upon their becoming more highly educated before entering the labor force. These realities also mean that the success of the economy will depend on add-

ing jobs in technologically sophisticated sectors for which the region has a competitive advantage. The training and expansion of the Visual Entertainment Industry fills both of these requirements. It is hoped that the "star power" of the sector will help lure students into the kind of rigorous training required to work in Visual Entertainment even if they ultimately do not work in it. A continuous flow of technologically sophisticated workers into the sector will help Southern California's economy to maintain a competitive edge in the kind of high paying cluster upon which its future will increasingly depend.

Areas such as the growing demand for cell phone content will impact the future of the industry; large companies such as Disney and Time Warner are rumored to soon create their own cell phone networks targeting specific demographics, according to Strategy Analytics, a technology research group. Earlier, it was mentioned that the North American market for mobile content could reach 14 billion by 2008.

The Entertainment Industry is also concerned with diversity issues and the major studios have programs in place with partnering organizations and associations to increase diversity in the industry. Community colleges should look for opportunities to work with these programs to assist individuals succeed.



Occupational Outlook

Job Growth & Demand. As this report has repeatedly indicated, the Visual Entertainment Industry will provide workers with the opportunity to undergo training to qualify them for work in one of Southern California's most competitive clusters. There are several ways in which the community colleges can participate. They can be the first two years of a four year education for workers wishing to go into occupations in the Visual Entertainment Industry that require at least a bachelor's degree. Community Colleges can also be the institution allowing students to overcome deficiencies in their educational foundations and take course work qualifying them for technical jobs in the Visual Entertainment Industry that require less than a four-year education. Another area is by offering specialized training through contract education. As technology continues to advance and evolve, workers will need short-term courses delivered during the evening or on weekends, which helps them sharpen specific skills. There may be an opportunity to partner with manufacturers on these types of courses.

1. **Community College & On To four-year College.** After completing two years at a community college, students who go on to receive a bachelor's degree can start in 14 different professions needed by the Visual Entertainment Industry.[7] The average starting salary for these jobs was $51,060 a year or $24.55 an hour in Los Angeles County in 2004 (*Exhibit 10*). With experience, the median pay in the group is $76,016 or $36.55 an hour. Experienced workers in the field averaged $94,795 or $45.57 an hour. Note, that these are the averages for all workers in these occupations in the county, not just those in the Visual Entertainment Industry. In fact, the industry tends to pay a premium (*Exhibit 2 earlier*). Workers trained in the industry can thus also work in a very large number of sectors in California with 550,600 jobs at the rates shown by 2012.

   Below exhibits 10 and 11, the jobs included are described. In Appendix F, a full list of EDD's descriptions along with the skills they need to possess for the jobs below are included. The descriptions are generic as people trained in the field can perform these tasks in the Visual Entertainment Industry or in other sectors of the economy Appendix E provides a web link to a comprehensive list of occupations within the entertainment industry. It includes descriptions, skills required, and identifies which positions are classified as entry-level.

[7] CA Employment Development Department, Occupational Profile, Motion Picture & Sound Sectors, 2004

Exhibit 10.-College Preparatory Work, Visual Entertainment Industry & Full Economy, 2004 L.A. County Pay Levels, 2012 California Jobs

OES	Description	Training	2012 VEI Jobs	2012 All Jobs	Entry-level Wage	Median Wage	Mean Wage	Experience Wages
113021	Computer and information systems managers	Work Experience, Plus Bachelor's or Higher	2,300	48,700	$67,249	$100,369	$106,700	$126,426
119041	Engineering managers	Work Experience	600	35,300	$79,448	$111,359	$115,650	$133,750
151031	Computer software engineers, applications	Bachelor's Degree	400	108,900	$58,734	$83,618	$83,108	$95,294
151032	Computer software engineers, systems software	Bachelor's Degree	1,700	74,500	$53,514	$80,034	$81,682	$95,765
151051	Computer systems analysts	Bachelor's Degree	500	70,600	$46,288	$66,768	$68,981	$80,328
151061	Database administrators	Bachelor's Degree	300	19,300	$36,838	$62,992	$63,818	$77,307
151071	Network and computer systems, administrators	Bachelor's Degree	700	45,900	$43,644	$62,087	$65,297	$76,123
151081	Network systems & data communication analysts	Bachelor's Degree	3,400	31,600	$40,855	$64,280	$66,361	$79,115
172061	Computer hardware engineers	Bachelor's Degree	100	21,000	$47,341	$76,653	$78,987	$94,809
172071	Electrical engineers	Bachelor's Degree	2,300	24,400	$56,468	$75,200	$77,953	$88,694
172072	Electronics engineers, except computer	Bachelor's Degree	100	36,100	$48,646	$78,652	$79,008	$94,190
172112	Industrial engineers	Bachelor's Degree	200	20,800	$50,064	$70,494	$70,503	$80,723
271014	Multi-media artists and animators	Work Experience, Plus Bachelor's or Higher	4,300	10,100	$44,874	$69,912	$77,813	$94,283
271021	Commercial and industrial designers	Work Experience, Plus Bachelor's or Higher	0	3,400	$38,299	$44,577	$50,490	$56,585
	ANNUAL		**16,900**	**550,600**	**$51,060**	**$76,016**	**$80,217**	**$94,795**
	HOURLY				**$24.55**	**$36.55**	**$38.57**	**$45.57**

Source: CA Employment Development Department

113021 Computer and information systems managers. These workers plan, direct, or coordinate activities in such fields as electronic data processing, information systems, systems analysis, and computer programming.

119041 Engineering managers. These workers plan, direct, or coordinate activities in such fields as architecture and engineering or research and development in these fields.

151031 Computer software engineers, applications. These workers develop, create, and modify general computer applications software or specialized utility programs

151032 Computer software engineers, systems software. These workers research, design, develop, and test operating systems-level software, compilers, and network distribution software for medical, industrial, military, communications, aerospace, business, scientific, and general computing applications. They set operational specifications and formulate and analyze software requirements.

151051 Computer systems analysts. These workers analyze science, engineering, business, and all other data processing problems for application to electronic data processing systems.

151061 Database administrators. These workers coordinate changes to computer databases, test and implement the database applying knowledge of database management systems.

151071 Network and computer systems, administrators. These workers install, configure, and support an organization's local area network (LAN), wide area network (WAN), and Internet system or a segment of a network system.

151081 Network systems & data communication analysts. These workers analyze, design, test, and evaluate network systems, such as local area networks (LAN), wide area networks (WAN), Internet, intranet, and other data communications systems.

172061 Computer hardware engineers. These workers research, design, develop, and test computer or computer-related equipment for commercial, industrial, military, or scientific use.

172071 Electrical engineers. These workers design, develop, test, or supervise the manufacturing and installation of electrical equipment, components, or systems for commercial, industrial, military, or scientific use.

172072 Electronics engineers, except computer. These workers research, design, develop, and test electronic components and systems for commercial, industrial, military, or scientific use utilizing knowledge of electronic theory and materials properties.

172112 Industrial engineers. These workers design, develop, test, and evaluate integrated systems for managing industrial production processes including human work factors, quality control, inventory control, logistics and material flow, cost analysis, and production coordination.

271014 Multi-media artists and animators. These workers create special effects, animation, or other visual images using film, video, computers, or other electronic tools and media for use in products or creations, such as computer games, movies, music videos, and commercials.

271021 Commercial and industrial designers. These workers develop and design manufactured products, such as cars, home appliances, and children's toys. They combine artistic talent with research on product use, marketing, and materials to create the most functional and appealing product design.

Community College Training & On To Work. A two year program at a community college would qualify workers to enter 13 technical fields in the Visual Entertainment Industry at an average starting salary of $29,121 a year or $14.00 an hour in Los Angeles County (*Exhibit 11*). With experience, the median pay in the group is $45,939 or $22.09 an hour. Experienced workers in the field averaged $66,488 or $31.97 an hour. Again note, that these are the averages for all work-

ers in these occupations in Los Angeles County, not just those in the Visual Entertainment Industry. In fact, the industry tends to pay a premium (*Exhibit 2 earlier*). Workers training for the industry will thus be able to work in some 299,500 jobs in California by 2012.

Also, note that in several cases, the jobs indicate a bachelor's degree requirement. This is the listing from EDD. Industry sources indicate that in each case there are numerous jobs in the sector that can be performed by trained technicians.

Exhibit 11.-Jobs After Community College, Visual Entertainment Industry & Full Economy, 2004 L.A. County Pay Levels, 2012 California Jobs

OES	Description	Training	2012 VEI Jobs	2012 All Jobs	Entry-level Wage	Median Wage	Mean Wage	Experience Wages
151021	Computer programmers	Bachelor's Degree	700	53,700	$47,255	$71,210	$74,543	$88,187
151041	Computer support specialists	Bachelor's Degree	2,400	73,400	$28,251	$42,693	$45,041	$53,437
173023	Electrical/electronic engineering technicians	Bachelor's Degree	1,500	32,000	$30,626	$47,389	$48,520	$57,467
271024	Graphic designers	Bachelor's Degree	1,300	25,300	$27,753	$44,372	$49,265	$60,021
274011	Audio and video equipment technicians	Moderate-Term On-the-Job Training	4,300	8,200	$23,167	$37,733	$43,662	$53,910
274012	Broadcast technicians	Post-Secondary Vocational Education	5,800	6,200	$23,669	$40,040	$49,369	$62,219
274014	Sound engineering technicians	Bachelor's Degree	2,800	3,800	$26,143	$49,016	$54,904	$69,285
274031	Camera operators, television, video, & film	Moderate-Term On-the-Job Training	4,300	5,200	$40,186	$50,835	$65,312	$83,304
274032	Film and video editors	Bachelor's Degree	4,500	5,200	$30,496	$53,145	$61,542	$77,065
472111	Electricians	Moderate-Term On-the-Job Training	0	72,000	$28,847	$41,377	$47,087	$56,207
492094	Electrical and electronics repairers, commercial and industrial equipment	Post-Secondary Vocational Education	400	10,700	$31,454	$43,922	$44,130	$50,468
499061	Camera and photographic equipment repairers	Moderate-Term On-the-Job Training	100	1,000	$35,993	$43,121	$44,864	$49,300
519131	Photographic process workers	Long-Term On-the-Job Training	100	2,800	$19,925	$30,374	$33,057	$39,624
	ANNUAL		**28,200**	**299,500**	**$29,121**	**$45,939**	**$53,480**	**$66,488**
	HOURLY				**$14.00**	**$22.09**	**$25.71**	**$31.97**

Source: CA Employment Development Department

Again, Appendix F lists these jobs along with EDD's description of what people in the field do and the skills they need to possess. The descriptions are generic as

people trained in the field can perform these tasks in the Visual Entertainment Industry or in other sectors of the economy. Appendix E provides a web link to a comprehensive list of occupations within the entertainment industry. It includes descriptions, skills required, and identifies which positions are classified as entry-level.

151021 Computer programmers. These workers convert project specifications and statements of problems and procedures to detailed logical flow charts for coding into computer language.

151041 Computer support specialists. These workers provide technical assistance to computer system users. They answer questions or resolve computer problems for clients in person, via telephone or from remote location.

173023 Electrical/electronic engineering technicians. These workers apply electrical and electronic theory and related knowledge, usually under the direction of engineering staff, to design, build, repair, calibrate, and modify electrical components, circuitry, controls, and machinery for subsequent evaluation and use by engineering staff in making engineering design decisions.

271024 Graphic designers. These workers apply electrical and electronic theory and related knowledge, usually under the direction of engineering staff, to design, build, repair, calibrate, and modify electrical components, circuitry, controls, and machinery for subsequent evaluation and use by engineering staff in making engineering design decisions.

274011 Audio and video equipment technicians. These workers set-up, or set up and operate audio and video equipment including microphones, sound speakers, video screens, projectors, video monitors, recording equipment, connecting wires and cables, sound and mixing boards, and related electronic equipment for concerts, sports events, meetings and conventions, presentations, and news conferences.

274012 Broadcast technicians. These workers set up, operate, and maintain the electronic equipment used to transmit radio and television programs.

274014 Sound engineering technicians. These workers operate machines and equipment to record, synchronize, mix, or reproduce music, voices, or sound effects in sporting arenas, theater productions, recording studios, or movie and video productions.

274031 Camera operators, television, video, and motion picture. These workers operate television, video, or motion picture camera to photograph images or scenes for various purposes, such as TV broadcasts, advertising, video production, or motion pictures.

274032 Film and video editors. These workers edit motion picture soundtracks, film, and video.

472111 Electricians. These workers install, maintain, and repair electrical wiring, equipment, and fixtures.

492094 Electrical and Electronics Repairers, Commercial. These workers repair, test, adjust, or install electronic equipment, such as industrial controls, transmitters, and antennas.

499061 Camera and photographic equipment repairers. These workers repair and adjust cameras and photographic equipment, including commercial video and motion picture camera equipment.

519131 Photographic process workers. These workers perform precision work involved in photographic processing, such as editing photographic negatives and prints, using photo-mechanical, chemical, or computerized methods.

Growing Demand. The recent history of the Visual Entertainment Industry supports the belief that there will be a growing need of training for jobs in the sector. As indicated (*Exhibit 5*), employment in the sector in California increased by 76,000 jobs from 1991-2002 (*35%*), despite the downward pressure exerted from 1999-2002 by the overvaluation of the U.S. versus the Canadian dollar, as well as the U.S. recession. The dollar has since fallen in value, the U.S. economy has recovered and the sector has responded in kind. The estimated gain from 1991-2004 is thus 308,000 jobs (*42%*). It should be noted again that the Visual Entertainment Industry traditionally has a business cycle that falls more than the economy in downturns and grows faster in upturns because it is one whose products involve people spending their discretionary income.

Historically, the Visual Entertainment Industry has been concentrated in Los Angeles County (*Exhibit 1: 64% of firms, Exhibit 4: 82% of jobs*) and recent data indicates that this continues to be the case, though there has been some growth in surrounding counties. Certainly, there will be a need for a continued flow of well-trained workers into the sector, if for no other reason than to allow it to keep up with the rapid changes in technology. These technological changes affect the way in which work is completed in traditional portions of the industry, while changing the definition of the sector to include new products such as video gaming. These facts may open the possibility of customized community college courses to upgrade the skills of existing workers.

Drivers. The key factors driving the demand for trained Visual Entertainment Industry workers in Southern California and Los Angeles County are:

- The expansion of the sector into an increasing number of venues now including motion pictures, television, music videos and video games, and cell phone content.
- The rapid pace of technological change in the industry and the resulting need for workers capable of producing at the leading edge of technical knowledge.
- The long-term growth of the sector as demand for its products increase.
- The ability of Los Angeles County to maintain its competitive share of the market.
- The value of the U.S. versus the Canadian dollar, which has a major influence on where production occurs.

- The high pay scales in the sector, which encourages students to develop the necessary skills to work in it.
- The glamour of the sector, which serves as a lure to attract workers to it. If nothing else, this results in people receiving training that qualifies them for jobs either in the sector or in a wide array of sectors with similar jobs.

Industry Training Needs

Skills, Competencies, Type & Scope of Training. The community colleges have the strategic opportunity to assist students in entering the Visual Entertainment Industry. This can be done in several ways. One is to provide students with the first two years of a four-year education for those occupations requiring a bachelor's degree before entering the industry. The second is to provide training for students who will complete a community college occupational program and go to work in the industry, even as the courses prepare them for attending a four-year institution in the future. A third alternative is the opportunity to develop contract education courses offering specialized areas of training.

- **Basic Education Foundation.** Some 59% of CSU freshman must take courses to make up for lack of ability to handle college level language or mathematics courses or work with computers. These are necessary knowledge areas for students wanting to work in the Visual Entertainment Industry. Students with language or mathematical deficiencies are often better served starting at community colleges, as overcoming these kinds of issues is one of their specialties.
- **Transfer Courses.** Students wishing to enter the Visual Entertainment Industry can take their freshman and sophomore transfer classes at a community college. As they will ultimately be science, computer, or engineering majors, this will be the best path for many of them to enter into this rigorous course of study.
- **Specialized Industry Courses.** Courses in digital technologies and high definition will be increasingly needed as well as additional courses as new technology emerges.
- **Technical Courses.** Students wishing to begin a career in Visual Entertainment as technicians must acquire a background in the systems, tools, and equipment they will be using. Most will need to understand how to manipulate virtual images using CAD or related systems. Most must learn to use and/or maintain sophisticated camera, sound, lighting, audio and digital editing and DVD systems. These skills must be honed in classes developed in coordination with the Visual Entertainment Industry. Students may also need some of the following depending on their pursued path: traditional programming, internet programming, Perl, Visual Basic, database programming, system design, color science, Avid, Final Cut Pro. However, software often changes quickly within the industry.
- **Soft Skills.** As has been mentioned throughout this report, students pursuing a career in the entertainment industry must possess entrepreneurial skills (including negotiation and managing budgets), strong communication, and problem

solving skills. Motivation and attitude are of major importance as well as the willingness of workers to be flexible to work inconsistent and long hours.

Thus, California's Community Colleges have a strategic opportunity to add value for students wishing to enter the Visual Entertainment industry.

Preferred Methods of Training. Training which can be delivered in the evenings or on weekends may assist those wishing to advance their skills while working. Hands-on instruction is important, which integrates the opportunity for students to create a product upon completion of the course. Internships and opportunities to mix with industry could provide students with the access they need to acquire a job.

Barriers. There are several major barriers to the success of students studying to enter a Visual Entertainment Industry occupation:

- The industry is highly competitive and one in which it will be difficult for students to acquire their first job.
- The project-based nature of work in the industry means that prospective workers must be willing to tolerate an unusually high level of job instability.
- Students must understand that they will likely work in more than one job at a time and simultaneously hold jobs inside and outside of the industry.
- The industry's job instability will be amplified by the fact that it tends to have boom and bust cycles that are deeper and higher than fluctuations in the U.S. economy.
- To acquire the skills needed for the industry, students must be willing to acquire solid verbal, mathematical, and computer skills.
- These barriers may be overcome by the fact that the industry has always had "star power" that motivates students to be committed. Today, that lure is reaching students who spend a good deal of time in front of computer screens. The sector also pays better than many other technological sectors.
- Many of the workers in the Visual Entertainment industry are organized through labor unions. For community colleges, it is important to work with unions in the design of two-year instructional programs.
- Lack of resources at the community colleges may prohibit them from acquiring advanced technology or expertise in the field; partnerships with industry, associations, and manufacturers may be able to assist in these areas.
- The rapid advancement of technology could put a strain on resources and prohibit colleges from providing the most current software and systems available. Again, partnerships with industry, associations, and manufacturers may be able to assist.

Summary

One of Southern California's key economic clusters is the Visual Entertainment Industry. It is composed of those firms involved in the production, post-production, distribution, visual effects and animation, and support services of motion pictures, television programs, music videos, and video and computer games. It is a sector in which Los Angeles County has maintained its competitive advantage due to the concentration of the industry's most important firms and a highly skilled knowledgeable workforce.

A community college considering offering training in this high technology sector should be aware of the need for workers to have strong educational fundamentals and sufficient scientific training to understand the technologies impacting their work. They will also need to work with the industry to ensure that workers learn requisite skills for manipulating virtual images, editing audio and video material, handling lighting, and working with cameras and DVD equipment.

Many workers in the Visual Entertainment Industry will need bachelor's degrees to be at the forefront of technology; however, these workers can be supported by technicians with less than four-year degrees, provided they have the necessary training and understanding of the technology. Community colleges can provide the first two years of higher education for students wanting knowledge of the field but planning to obtain a bachelor's degree. They can also develop programs that give workers the background they need to start work as technicians after two years of schooling. Another, often overlooked opportunity, is the area of contract education and community service programs. There are opportunities to assist workers in the industry sharpen their skills in specific technologies, or expose individuals to the array of occupations within the industry.

Students interested in the Visual Entertainment Industry should know that it is a highly competitive industry and workers in it face a good deal of job instability. A major reason is the project-based organization of work with teams formed to work on a project and then dispersing when it is done. The ability to be continuously employed thus depends on a worker's abilities, contacts, entrepreneurial skills, and willingness to apply their skills outside the industry. For those interested in technology related occupations, cross-working opportunities are being explored, which could assist colleges to better guide students when seeking employment.

Fortunately, the pay scales in the industry are sufficiently strong to justify the risk. The jobs for which community colleges can train workers to begin as technicians have a median pay of $45,939. Experienced workers in these fields earn an average of $66,488. Importantly, even if students take courses for the Visual Entertainment Industry but never work in it, their training will likely provide them with skills to obtain well-paying technical jobs in other industries.

This industry is dynamic and complex. As it continues to expand new areas of opportunity will emerge in the growing area of mobile phone content including infotainment.

The community colleges have an opportunity to expand programs in this industry and should further explore opportunities in the following areas:

- Digital technologies training for emerging occupations such as Digital Image Technicians and Image Capture Technicians.
- Entry-level training opportunities for technicians
- Contract education opportunities for incumbent workers or those needing to upgrade their skills
- Entrepreneurial training integrated into existing programs
- Expanded partnerships with industry associations and manufacturers

The colleges could integrate a variety of soft skills training into the existing curricula, as well as provide a better understanding of the overall industry, how it operates, and an introduction to the wide range of occupations available.

As the opportunity for "cross-working" is further explored and validated, skills may be identified that are utilized in occupations across industries which can be built into cross-industry training and curricula so that students will be more marketable and have broader employment opportunities.

Notes:

1. This report states repeatedly that students training for the Visual Entertainment Industry are simultaneously training for the same jobs in a wide variety of other sectors. While they may never work in the industry, their training will still qualify them for very high salaried jobs. The table in Appendix D shows the degree of cross training for each job category.

2. The jobs used for this analysis were those that could be precisely defined from EDD data with readily available data by OES code. They are the technical jobs that are part of the staffing pattern in four sectors:

Motion Picture and Video Industries (NAICS 512100)
Sound Recording Industries (NAICS 512200)
Radio and Television Broadcasting (NAICS 515100)
Cable and Other Subscription Programming (NAICS 515200)

Recently, the Entertainment Economy Institute has completed work defining the skill sets in four aspects of the industry in greater detail. The results of their work can be accessed via a link to the EWD website provided in Appendix E.

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APPENDIX A: How to Utilize This Scan

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, increase awareness and visibility about the colleges economic and workforce development programs and services, and build partnerships with business and industry.

The work of the COEs help position the Community Colleges as THE workforce partners of choice to business and industry and ensure that college programs are current and market-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, the Business and Workforce Performance Improvement Centers of Excellence, the COE host college, and the California Community Colleges Chancellor's Office are NOT responsible for applications or decisions made by recipient Community Colleges or their representatives based upon this study including components or recommendations.

This project is funded in part by the California Community Colleges Chancellor's Office Economic and Workforce Development Program: grant 04-305-009 for $178,875 to fund multiple projects and activities through the Center of Excellence.

Appendix B. Industry Organizations

There are numerous associations serving the Entertainment industry and its varying industry segment. The following are some of them:

Academy of Interactive Arts & Sciences The AIAS is dedicated to the advancement and recognition of interactive arts. They conduct an annual awards show. Members must have 2 years continuous full-time experience on a design team or as a quality control executive.

Academy of Motion Picture Arts & Sciences Perhaps most widely known for producing the Oscar Awards, the AMPAS organizes educational and cultural activities in the motion picture industry.

Academy of Television Arts & Sciences ATAS in the non-profit organization that produces the Emmy Awards. The organization focuses on the history and artistry of TV.

Affiliated Property Craftspersons (IA Local 44)

Alliance of Motion Picture & Television Producers The AMPTP provides services to member companies in all aspects of employment in the film & television industry. It also serves as the bargaining agent for its member companies.

American Cinema Editors Founded in 1952, this group focuses on the craft of film editing in the motion picture industry.

American Federation of Television and Radio Artists (AFTRA)

American Society of Cinematographers The ASC provides information on film festivals, awards, and new technologies for cinematographers.

American Society of Composers, Authors, and Publishers The function of ASCAP is to protect the rights of its members by licensing and paying royalties for their work.

Art Directors Guild & Scenic, Title, and Graphic Artists (Local 800)

ASIFA-Hollywood (International Animated Film Society) An international organization promoting and supporting the art of animation. Goals are to support animation education and increase public awareness and social interaction among animation professionals.

Association of Film Commissioners International The AFC International serves as a liaison between the production industry and member film companies.

Association of Independent Commercial Producers (AICP-West) Represents the voice of commercial production companies and suppliers. It also serves as a tool for developing industry standards and facilitates dialogue between members and the advertising community.

Association of Independent Creative Editors (AICE) Represents the needs and interests of independent editorial companies doing post-production for commercials. The Los Angeles chapter has over 30 member companies.

Association of Interactive Marketing (AIM) Trade association for interactive media.

Association of Movie Imaging Archivists Focuses on the preservation of moving image materials.

Broadcast Music, Inc. A performance rights organization, which supports writers and publishers in music, film and television.

California Directory of Local Secretaries and Business Agents (IA Local 504)

California Film Commission Dedicated to enhancing California's position as leader in motion picture & television production. Issues permits for filming on state-owned property and manages California filming incentive programs.

Cinema Audio Society Active members are Mixers. Associate members are Sound Editors, Technicians, Recordist and Microphone Boom Operators.

Costume Designers Guild (IA Local 892)

Costume Society of America Offers scholarship opportunities for students and they have demonstrations of mannequin making and dressing, display, conservation and preservation techniques.

Digital Cinema Society. http://www.digitalcinemasociety.org/ A nonprofit corporation dedicated to educating and informing the entertainment industry about digital motion picture production, post, delivery, and exhibition.

Directors Guild of America

Entertainment Industry Development Corporation (EIDC) EIDC facilitates filming on location in the City and unincorporated areas of the County of Los Angeles and several other jurisdictions under contract.

Entertainment Services and Technology Association (ESTA) Trade association that provides services to member companies who are manufacturers and distributors of lighting goods.

Entertainment Software Association (ESA) Trade association of video and computer game manufacturers.

Film and Television Action Committee (FTAC) A volunteer, grass-roots organization dedicated to the protection and recovery of American film jobs lost to foreign nations and workers in the form of runaway production.

Film Arts Foundation Non-profit Bay Area based organization dedicated to the support of independent film and video makers.

Hollywood Post Alliance A trade association representing professionals whose business involves the creation and finishing of motion pictures, television, commercials, digital media and other dynamic media content.

IATSE & MPAATC/West Coast (AFL-CIO) *Note: IA stands for the International Alliance of Theatrical Stage Employees (IATSE). CWA stands for the Communications Workers of America.*

Independent Feature Project A not-for-profit organization which promotes independent film and film-making. Conducts frequent screenings, and provides resources, information and networking opportunities for its 4,500+ members.

Independent Film and Television Association (formerly AFMA) Nonprofit trade association with 150+ companies. Concerned with production and distribution of independent English language titles internationally.

International Association of Audio Visual Communicators (AVC)
Organization composed of media producers, managers, & creative / technical people in industry, government, education, technical, promotional, and enrichment fields.

International Cinematographers Guild (IA Local 600)

International Documentary Association Provides publications, benefits and networking on issues regarding film, video and multimedia.

International Game Developers Association Promotes the high tech computer graphics used in both games and the entertainment industry.

International Sound Technicians (IA Local 695)

Makeup Artists & Hair Stylists (IA Local 706)

Media Communications Association International (ITA) A networking association for those involved in video, film, distance learning, web design and creation, and all forms of interactive visual communication.

Media Human Resources Association - A Division of the Society for Human Resources Managers Offers industry specific information sessions at the S.H.R.M. Annual conference. Provides a service called "media mail" which serves as a networking tool for members.

Motion Picture Association of America, Inc. (MPAA) A trade association and advocate for the motion picture, home video and TV industries. Members include all major studios.

Motion Picture Costumers (IA Local 705)

Motion Picture Editors Guild (IA Local 700)

Motion Picture Set Painters & Sign Writers (IA Local 729)

Motion Picture Sound Editors An organization for professional sound and music editors who work in motion pictures and television.

Motion Picture Studio First Aid Employees (IA Local 767)

Motion Picture Studio Grips (IA Local 80)

Music Video Production Association (MVPA) Nonprofit trade association. Over 300 members; the majority are music video production and post-production companies.

National Academy of Recording Arts and Sciences (NARAS) Fosters creative leadership in the recording field. They present the Grammy Awards.

National Alliance for Media Arts and Culture (NAMAC) This organization provides media education, production, and preservation and advocacy services for individual media artists.

National Association of Broadcast Employees and Technicians (CWA Local 53)

NAMM – International Music Products Association (formerly National Association of Music Merchants) an international association representing nearly 9,000 retailers and manufacturers of musical instruments and products from 85 countries worldwide.

National Association of Television Program Executives (NATPE) An alliance of media content professionals. Over 4,000 corporate members. They provide education, networking and technical guidance.

National Cartoonists Society NCS / Southern California Cartoon Society Professional society for cartoonists. Prepares exhibits and provides aid to ill & needy cartoonists.

Producer's Guild of America

Production Equipment Rental Association (PERA) A global trade association with 200 members that promotes production equipment rental industry, with specialties in lighting, grip, audio, communication & staging equipment.

Screen Actors Guild

Script Supervisors & Continuity Coordinators (IA Local 871)

Set Decorators Society of America Members are both union and non-union set decorators.

Set Designers & Model Makers (IA Local 847)

SIGGRAPH - ACM Special Interest Group on Computer Graphics
http://www.siggraph.org/ Technical association specializing in computer and digital technologies. Their education committee provides information on career enhancement and activities relating to digital technology.

Society of Motion Picture and Television Engineers http://www.smpte.org/ Offers standards, test materials and publications designed to assist its members in career enhancement.

Studio Electrical Lighting Technicians (IA Local 728)

The Animation Guild (IA Local 839)

Treasurers & Ticketsellers (IA Local 857)

United Scenic Artists (Local 829)

Video Electronics Standards Association Provides a global network for promoting standards in higher technology.

Visual Effects Society 180 members working in visual effects. Goals: to promote awareness of visual effects industry, support technology research & development, and design & implement education programs.

Women in Film (WIF) Committee to recognize and support unique visions of women in global telecommunications. 22 chapters world wide. 2000 members in Los Angeles, representing all facets of entertainment industry.

Workplace Hollywood. A non-profit dedicated to developing, training, and placing a qualified and diverse workforce in the entertainment industry. http://www.workplacehollywood.org/

Writers Guild of America West

YLEM - Artists Using Science and Technology Promotes the use of scientific images and advanced technological methods in art.

Appendix C. Industry Reports

Los Angeles Economic Development Corporation http://laedc.org/

2005-06 Economic Forecast & Industry Outlook for five-county Los Angeles area http://laedc.info/data/documents.asp

Recapturing the Dream: A Winning Strategy for the LA Region
http://laedc.org/data/pdf/LAEDC_recapturingthedream.pdf

Entertainment Economy Institute www.entertainmentecon.org

Cross-working: High-Tech Motion Picture and Television Workers in California-Exploring Employment Patterns and Industry Cross-over Opportunities. June 2005. Identifies 32 high-tech occupations within the entertainment industry and explores opportunities for cross-working in other industries.

California's Entertainment Workforce: Employment Earnings 1991-2002

This report fills an important gap in the understanding of recent trends related to jobs and workforce in the industry. EEI was able to access information not available to other entities. As a result, this report provides an important new look at the labor market dynamics of the entertainment industry.

Reel Jobs: Production Careers in Entertainment EIDC & The PMR Group, Inc. Spring 2001. Explores opportunities "on set and behind the camera." Includes background on work on the set, descriptions of opportunities in production support services, skills that contribute to industry success, and a list of training/job preparation programs and curricula. Available for free download in Adobe Acrobat format.

Amazing Post: Post-Production Careers in the Entertainment Industry EIDC & the PMR Group, Inc. March 1999. Explores opportunities in media post-production. Includes background on this industry segment, an analysis of post-production work flow, position descriptions, and list of job training/job preparation programs and curricula. Available for free download in Adobe Acrobat format.

Digital Distribution & Interactive Entertainment: A Labor Market Analysis and Sectoral Workforce Development Strategies EIDC & The PMR Group, Inc. June 2002. Prepared for The City of Los Angeles Workforce Investment Board. Department of Labor, Sectoral Employment Demonstration, SGA/DFA 01-104. An identification and analysis of the web-based entertainment, games, and digital distribution industries' market structure, employment patterns, wages and benefits, skill requirements and terms of employment. The report is a foundation for the development of strategies to serve dislocated industry employees and new entrants to the industry. This publication is not available online.

Making Digits Dance: Visual Effects and Animation Careers in the Entertainment Industry EIDC & the PMR Group, Inc. March 1997. Explores opportunities in animation and visual effects. Includes background on rapid technological change in this industry, an analysis of skills critical to workplace success, job

titles and responsibilities, and a list of training/job preparation programs and curricula. Available for free download in Adobe Acrobat format.

Entertainment Careers http://www.entertainmentcareers.cc/ *EIDC & The PMR Group, Inc. Spring 2001* A free, online-only guide for job seekers interested in exploring opportunities in entertainment.

Motion Picture Production in California

Martha Jones, Ph.D., California Research Bureau. March 2002. Requested by Assembly Member Dario Frommer, Chair of the Select Committee on the Future of California's Film Industry. This report analyzes the economic impact of the motion picture industry on California, the difficulties one encounters when trying to collect and analyze statistical data regarding this industry, and the threat posed to the vitality of the CA economy in the form of runaway production.

Appendix D. Degree of Cross Training

This report states repeatedly that students training for the Visual Entertainment Industry are simultaneously training for the same jobs in a wide variety of other sectors. While they may never work in the industry, their training will still qualify them for very high paying jobs. The table below shows the degree of cross training for each job category.

Exhibit 11.Jobs After Community College, Visual Entertainment Industry, Los Angeles County

OES	Description	Training	2012 VEI Jobs	2012 All Jobs	Number of Other Sectors Using Skill			
113021	Computer and information systems managers	Work Experience, Plus Bachelor's or Higher	2,300	48,700	241			
119041	Engineering managers	Work Experience	600	35,300	173			
151031	Computer software engineers, applications	Bachelor's Degree	400	108,900	147			
151032	Computer software engineers, systems software	Bachelor's Degree	1,700	74,500	111			
151051	Computer systems analysts	Bachelor's Degree	500	70,600	196			
151061	Database administrators	Bachelor's Degree	300	19,300	183			
151071	Network and computer systems, administrators	Bachelor's Degree	700	45,900	232			
151081	Network systems & data communication analysts	Bachelor's Degree	3,400	31,600	153			
172061	Computer hardware engineers	Bachelor's Degree	100	21,000	53			
172071	Electrical engineers	Bachelor's Degree	2,300	24,400	108			
172072	Electronics engineers, except computer	Bachelor's Degree	100	36,100	80			
172112	Industrial engineers	Bachelor's Degree	200	20,800	154			
271014	Multi-media artists and animators	Work Experience, Plus Bachelor's or Higher	4,300	10,100	55			

271021	Commercial and industrial designers	Work Experience, Plus Bachelor's or Higher	0	3,400	86			
151021	Computer programmers	Bachelor's Degree	700	53,700	240			
151041	Computer support specialists	Bachelor's Degree	2,400	73,400	258			
173023	Electrical/electronic engineering technicians	Bachelor's Degree	1,500	32,000	129			
271024	Graphic designers	Bachelor's Degree	1,300	25,300	174			
274011	Audio and video equipment technicians	Moderate-Term On-the-Job Training	4,300	8,200	66			
274012	Broadcast technicians	Post-Secondary Vocational Education	5,800	6,200	22			
274014	Sound engineering technicians	Bachelor's Degree	2,800	3,800	31			
274031	Camera operators, television, video, & film	Moderate-Term On-the-Job Training	4,300	5,200	157			
274032	Film and video editors	Bachelor's Degree	4,500	5,200	18			
472111	Electricians	Moderate-Term On-the-Job Training	0	72,000	169			
492094	Electrical and electronics repairers, commercial and industrial equipment	Post-Secondary Vocational Education	400	10,700	128			
499061	Camera and photographic equipment repairers	Moderate-Term On-the-Job Training	100	1,000	17			
519131	Photographic process workers	Long-Term On-the-Job Training	100	2,800	32			

Appendix E. Job Descriptions by Industry Segment

A comprehensive list of **MOTION PICTURE AND TELEVISION INDUSTRY OCCUPATIONS BY INDUSTRY SEGMENT can be found at the link:**

http://cccewd.net/files/resources/MP_&_TV_Occupations.doc

These include Production, Post Production, Visual Effects and Animation, and Distribution occupations. The additional area of High Tech Support is added but is not considered an industry segment.

The Center of Excellence and the Multimedia Entertainment Initiative would like to acknowledge The Entertainment Economy Institute for compiling this information.

Appendix F. Job Descriptions and Duties of Projected Jobs

113021 Computer and information systems managers. These workers plan, direct, or coordinate activities in such fields as electronic data processing, information systems, systems analysis, and computer programming. Duties include: Analyzes workflow and assigns or schedules work to meet priorities and goals. Approves, prepares, monitors, and adjusts operational budget. Consults with users, management, vendors, and technicians to determine computing needs and system requirements. Develops and interprets organizational goals, policies, and procedures, and reviews project plans. Develops performance standards and evaluates work in light of established standards.

119041 Engineering managers. These workers plan, direct, or coordinate activities in such fields as architecture and engineering or research and development in these fields. Their duties include: Administers highway planning, construction, and maintenance, and reviews and recommends or approves contracts and cost estimates. Analyzes technology, resource needs, and market demand, and confers with management, production, and marketing staff to plan and assess feasibility of project. Confers with and prepares reports for officials and speaks to public to solicit support. Directs engineering of water control, treatment, and distribution projects. Directs, reviews, and approves product design and changes, and directs testing.

151031 Computer software engineers, applications. These workers develop, create, and modify general computer applications software or specialized utility programs. They analyze user needs and develop software solutions. They design software or customize software for client use with the aim of optimizing operational efficiency. They may analyze and design databases within an application area, working individually or coordinating database development as part of a team. Their work includes: Analyzes information to determine, recommend, and plan layout for type of computers and peripheral equipment modifications to existing systems. Analyzes software requirements to determine feasibility of design within time and cost constraints. Confers with data processing and project managers to obtain information on limitations and capabilities for data processing projects. Consults with customer concerning maintenance of software system. Consults with engineering staff to evaluate interface between hardware and software and operational and performance requirements of overall system.

151032 Computer software engineers, systems software. These workers research, design, develop, and test operating systems-level software, compilers, and network distribution software for medical, industrial, military, communications, aerospace, business, scientific, and general computing applications. They set operational specifications and formulate and analyze software requirements. They apply principles and techniques of computer science, engineering, and mathematical analysis. Their duties include: Analyzes information to determine, recommend, and plan layout for type of computers and peripheral equipment

modifications to existing systems. Analyzes software requirements to determine feasibility of design within time and cost constraints. Confers with data processing and project managers to obtain information on limitations and capabilities for data processing projects. Consults with customer concerning maintenance of software system. Consults with engineering staff to evaluate interface between hardware and software and operational and performance requirements of overall system.

151051 Computer systems analysts. These workers analyze science, engineering, business, and all other data processing problems for application to electronic data processing systems. They analyze user requirements, procedures, and problems to automate or improve existing systems and review computer system capabilities, workflow, and scheduling limitations. They may analyze or recommend commercially available software. Their duties include: Analyzes and tests computer programs or system to identify errors and ensure conformance to standard. Assists staff and users to solve computer related problems, such as malfunctions and program problems. Consults with staff and users to identify operating procedure problems. Coordinates installation of computer programs and operating systems, and tests, maintains, and monitors computer system. Devises flow charts and diagrams to illustrate steps and to describe logical operational steps of program.

151061 Database administrators. These workers coordinate changes to computer databases, test and implement the database applying knowledge of database management systems. They may plan, coordinate, and implement security measures to safeguard computer databases. Their responsibilities include: Codes data base descriptions and specifies identifiers of database to management system or directs others in coding descriptions. Confers with coworkers to determine scope and limitations of project. Develops data model describing data elements and how they are used, following procedures using pen, template or computer software. Directs programmers and analysts to make changes to data base management system. Establishes and calculates optimum values for data base parameters, using manuals and calculator.

151071 Network and computer systems, administrators. These workers install, configure, and support an organization's local area network (LAN), wide area network (WAN), and Internet system or a segment of a network system. They maintain network hardware and software. Monitor network to ensure network availability to all system users and perform necessary maintenance to support network availability. They may supervise other network support and client server specialists and plan, coordinate, and implement network security measures. Their duties include: Confers with personnel to discuss issues such as computer data access needs, security violations, and programming changes. Coordinates implementation of computer system plan with establishment personnel and outside vendors. Develops plans to safeguard computer files against accidental or unauthorized modification, destruction, or disclosure and to meet emergency data processing needs. Modifies computer security files to incorpo-

rate new software, correct errors, or change individual access status .Monitors use of data files and regulates access to safeguard information in computer files.

151081 Network systems & data communication analysts. These workers analyze, design, test, and evaluate network systems, such as local area networks (LAN), wide area networks (WAN), Internet, intranet, and other data communications systems. They perform network modeling, analysis, and planning. They research and recommend network and data communications hardware and software. The group includes telecommunications specialists who deal with the interfacing of computer and communications equipment. They may supervise computer programmers. Their duties include: Analyzes test data and recommends hardware or software for purchase. Assists users to identify and solve data communication problems. Conducts survey to determine user needs. Develops and writes procedures for installation, use, and solving problems of communications hardware and software. Identifies areas of operation which need upgraded equipment, such as modems, fiber optic cables, and telephone wires.

172061 Computer hardware engineers. These workers research, design, develop, and test computer or computer-related equipment for commercial, industrial, military, or scientific use. They may supervise the manufacturing and installation of computer or computer-related equipment and components. Their duties include: Analyzes information to determine, recommend, and plan layout for type of computers and peripheral equipment modifications to existing systems. Analyzes software requirements to determine feasibility of design within time and cost constraints. Confers with data processing and project managers to obtain information on limitations and capabilities for data processing projects. Consults with customer concerning maintenance of software system. Consults with engineering staff to evaluate interface between hardware and software and operational and performance requirements of overall system.

172071 Electrical engineers. These workers design, develop, test, or supervise the manufacturing and installation of electrical equipment, components, or systems for commercial, industrial, military, or scientific use. Their work includes: Collects data relating to commercial and residential development, population, and power system interconnection to determine operating efficiency of electrical systems. Compiles data and writes reports regarding existing and potential engineering studies and projects. Conducts field surveys and studies maps, graphs, diagrams, and other data to identify and correct power system problems. Confers with engineers, customers, and others to discuss existing or potential engineering projects and products. Designs electrical instruments, equipment, facilities, components, products, and systems for commercial, industrial, and domestic purposes.

172072 Electronics engineers, except computer. These workers research, design, develop, and test electronic components and systems for commercial, industrial, military, or scientific use utilizing knowledge of electronic theory and materials properties. They design electronic circuits and components for use in fields such as telecommunications, aerospace guidance and propulsion control,

acoustics, or instruments and controls. Their duties include: Analyzes system requirements, capacity, cost, and customer needs to determine feasibility of project and develop system plan. Conducts studies to gather information regarding current services, equipment capacities, traffic data, and acquisition and installation costs. Confers with engineers, customers, and others to discuss existing and potential engineering projects or products. Designs electronic components, products and systems for commercial, industrial, medical, military, and scientific applications. Determines material and equipment needs and orders supplies.

172112 Industrial engineers. These workers design, develop, test, and evaluate integrated systems for managing industrial production processes including human work factors, quality control, inventory control, logistics and material flow, cost analysis, and production coordination. Their duties include: Analyzes statistical data and product specifications to determine standards and establish quality and reliability objectives of finished product. Applies statistical methods and performs mathematical calculations to determine manufacturing processes, staff requirements, and production standards. Communicates with management and user personnel to develop production and design standards. Completes production reports, purchase orders, and material, tool, and equipment lists. Confers with vendors, staff, and management personnel regarding purchases, procedures, product specifications, manufacturing capabilities, and project status.

271014 Multi-media artists and animators. These workers create special effects, animation, or other visual images using film, video, computers, or other electronic tools and media for use in products or creations, such as computer games, movies, music videos, and commercials.

271021 Commercial and industrial designers. These workers develop and design manufactured products, such as cars, home appliances, and children's toys. They combine artistic talent with research on product use, marketing, and materials to create the most functional and appealing product design. Their duties include: Confers with engineering, marketing, production, or sales department, or customer to establish design concepts for manufactured products. Creates and designs graphic material for use as ornamentation, illustration, or advertising on manufactured materials and packaging. Designs packaging and containers for products, such as foods, beverages, toiletries, or medicines. Directs and coordinates preparation of detailed drawings from sketches or fabrication of models or samples. Evaluates design ideas for feasibility based on factors, such as appearance, function, serviceability, budget, production costs/methods, and market characteristics.

151021 Computer programmers. These workers convert project specifications and statements of problems and procedures to detailed logical flow charts for coding into computer language. They develop and write computer programs to store, locate, and retrieve specific documents, data, and information. They may program web sites. Their work includes: Analyzes, reviews, and rewrites programs, using workflow chart and diagram, applying knowledge of computer capabilities, subject matter, and symbolic logic. Assigns, coordinates, and reviews

work and activities of programming personnel. Assists computer operators or system analysts to resolve problems in running computer program. Collaborates with computer manufacturers and other users to develop new programming methods. Compiles and writes documentation of program development and subsequent revisions.

151041 Computer support specialists. These workers provide technical assistance to computer system users. They answer questions or resolve computer problems for clients in person, via telephone or from remote location. They may provide assistance concerning the use of computer hardware and software, including printing, installation, word processing, electronic mail, and operating systems. Their duties include: Conducts office automation feasibility studies, including workflow analysis, space design, and cost comparison analysis. Confers with staff, users, and management to determine requirements for new systems or modifications. Develops training materials and procedures, and conducts training programs. Enters commands and observes system functioning to verify correct operations and detect errors. Inspects equipment and reads order sheets to prepare for delivery to users.

173023 Electrical/electronic engineering technicians. These workers apply electrical and electronic theory and related knowledge, usually under the direction of engineering staff, to design, build, repair, calibrate, and modify electrical components, circuitry, controls, and machinery for subsequent evaluation and use by engineering staff in making engineering design decisions. Their duties include: Adjusts and replaces defective or improperly functioning circuitry and electronics components, using hand tools and soldering iron. Assembles circuitry or electronic components, according to engineering instructions, technical manuals, and knowledge of electronics using hand tools and power tools. Assists engineers in development of testing techniques, laboratory equipment, and circuitry or installation specifications, by writing reports and recording data. Designs basic circuitry and sketches for design documentation, as directed by engineers, using drafting instruments and computer aided design equipment. Fabricates parts, such as coils, terminal boards, and chassis, using bench lathes, drills, or other machine tools.

271024 Graphic designers. These workers apply electrical and electronic theory and related knowledge, usually under the direction of engineering staff, to design, build, repair, calibrate, and modify electrical components, circuitry, controls, and machinery for subsequent evaluation and use by engineering staff in making engineering design decisions. They adjust and replace defective or improperly functioning circuitry and electronics components, using hand tools and soldering iron. They assemble circuitry or electronic components, according to engineering instructions, technical manuals, and knowledge of electronics using hand tools and power tools. They assist engineers in development of testing techniques, laboratory equipment, and circuitry or installation specifications, by writing reports and recording data. They design basic circuitry and sketches for design documentation, as directed by engineers, using drafting instruments and

computer aided design equipment. They fabricate parts, such as coils, terminal boards, and chassis, using bench lathes, drills, or other machine tools.

274011 Audio and video equipment technicians. These workers set up or set up and operate audio and video equipment including microphones, sound speakers, video screens, projectors, video monitors, recording equipment, connecting wires and cables, sound and mixing boards, and related electronic equipment for concerts, sports events, meetings and conventions, presentations, and news conferences. May also set up and operate associated spotlights and other custom lighting systems. Their duties include: Conducts training sessions on selection, use, and design of audiovisual materials, and operation of presentation equipment. They construct and position properties, sets, lighting equipment, and other equipment. Determines format, approach, content, level, and medium to meet objectives most effectively within budgetary constraints, utilizing research, knowledge, and training. Develops manuals, texts, workbooks, or related materials for use in conjunction with production materials. Develops production ideas based on assignment or generates own ideas based on objectives and interest.

274012 Broadcast technicians. These workers set up, operate, and maintain the electronic equipment used to transmit radio and television programs. Control audio equipment to regulate volume level and quality of sound during radio and television broadcasts. Operate radio transmitter to broadcast radio and television programs. These workers duties may include: Aligns antennae with receiving dish to obtain clearest signal for transmission of news event to station. Drives news van to location of news events. Edits manuals, schedules programs, and prepares reports outlining past and future programs, including content. Instructs trainees how to use television production equipment, to film events, and to copy/edit graphics or sound onto videotape. Lays electrical cord and audio and video cables between vehicle, microphone, camera, and reporter or person to be interviewed.

274014 Sound engineering technicians. These workers operate machines and equipment to record, synchronize, mix, or reproduce music, voices, or sound effects in sporting arenas, theater productions, recording studios, or movie and video productions. Their duties include: Keeps log of recordings. Maintains recording equipment. Mixes and edits voices, music, and taped sound effects, during stage performances using sound mixing board. They record speech, music, and other sounds on recording media, using recording equipment. Regulates volume level and quality of sound during motion picture, phonograph, television, or radio production recording sessions, using control console.

274031 Camera operators, television, video, and motion picture. These workers operate television, video, or motion picture camera to photograph images or scenes for various purposes, such as TV broadcasts, advertising, video production, or motion pictures. Their work includes: Adjusts position and controls of camera, printer and related equipment to produce desired effects, using precision measuring instruments. Analyzes specifications to determine work

procedures, sequence of operations, and machine setup. Confers with director and electrician regarding interpretation of scene, desired effects, filming and lighting requirements. Exposes frames of film in sequential order and regulates exposures and aperture to obtain special effects. Instructs camera operators regarding camera setup, angles, distances, movement, and other variables and cues for starting and stopping filming.

274032 Film and video editors. These workers edit motion picture soundtracks, film, and video. Their duties include: Edits film and video tape to insert music, dialogue, and sound effects, and to correct errors, using editing equipment. Evaluates and selects scenes in terms of dramatic and entertainment value and story continuity. Reviews assembled film or edited video tape on screen or monitor and makes corrections. Studies script and confers with producers and directors concerning layout or editing to increase dramatic or entertainment value of production. Supervises and coordinates activities of workers engaged in editing and assembling filmed scenes photographed by others.

472111 Electricians. These workers install, maintain, and repair electrical wiring, equipment, and fixtures. They ensure that work is in accordance with relevant codes. They may install or service street lights, intercom systems, or electrical control systems. Their duties include: Climbs ladder to install, maintain or repair electrical wiring, equipment and fixtures. Constructs and fabricates parts, using hand tools and specifications. Diagnoses malfunctioning systems, apparatus, and components, using test equipment and hand tools. Directs and trains workers to install, maintain, or repair electrical wiring, equipment, and fixtures. Drives vehicle, operates flood lights, and places flares during power failure or emergency.

492094 Electrical and Electronics Repairers, Commercial. These workers repair, test, adjust, or install electronic equipment, such as industrial controls, transmitters, and antennas. They adjust defective components, using hand tools and technical documents. Their duties include: Advises management regarding customer satisfaction, product performance, and suggestions for product improvements. Analyzes technical requirements of customer desiring to utilize electronic equipment, and performs installation and maintenance duties. Calibrates testing instruments and installed or repaired equipment to prescribed specifications. Consults with customer, supervisor, and engineers to plan layout of equipment and to resolve problems in system operation and maintenance.

499061 Camera and photographic equipment repairers. These workers repair and adjust cameras and photographic equipment, including commercial video and motion picture camera equipment. Their duties include: Adjusts cameras, photographic mechanisms, and equipment, such as range and view finders, shutters, light meters, and lens systems, using hand tools. Assembles aircraft cameras, still and motion picture cameras, photographic equipment, and frames, using diagrams, blueprints, bench machines, hand tools, and power tools. Calibrates and verifies accuracy of light meters, shutter diaphragm operation, and lens carriers, using timing instruments. Cleans and lubricates cameras

and polishes camera lenses, using cleaning materials and work aids. Disassembles equipment to gain access to defect, using hand tools.

519131 Photographic process workers. These workers perform precision work involved in photographic processing, such as editing photographic negatives and prints, using photo-mechanical, chemical, or computerized methods. Their duties include: Applies paint to retouch or enhance negative or photograph, using airbrush, pen, artist's brush, cotton swab, or gloved finger. Cuts out masking template, using shears, and positions templates on picture to mask selected areas. Examines drawing, negative, or photographic print to determine coloring, shading, accenting, and changes required to retouch or restore. Inks borders or lettering on illustration, using pen, brush, or drafting instruments. Mixes ink or paint solutions, according to color specifications, color chart, and consistency desired.

Appendix G. Training Currently Available

Workplace Hollywood is a non-profit organization dedicated to developing, training, and placing a qualified and diverse workforce in the entertainment industry. They are presently compiling a comprehensive database that will identify entertainment related training programs throughout California. The database, when completed, will be available on their website: **http://www.workplacehollywood.org/**

Below is a description of the training database:

> "The Education and Training Inventory Project identifies statewide programs and institutions based in California that provide access to academic study or hands-on training for career areas including Film Production, Television/Video Production, Post Production, Animation, Multimedia/Media Arts and Broadcasting. Each listing provides a program description, area(s) of study, curriculum emphasis, degree or certificate possibilities, admissions requirements, enrollment data, academic calendar, faculty demographics, facilities and equipment descriptions, tuition and fees required, and contact information. This comprehensive inventory is a valuable resource for individuals looking to enter or increase their skill-sets for the entertainment industry whether in production or the professional administrative markets."

Community College Programs

Royston Thomas at the Los Angeles Community College District has created a website that provides information on entertainment studies through the nine colleges of the Los Angeles Community College District. The website can be accessed at:

http://www.laccd.edu/workforce_dev/create-la/courses.htm

Additional community colleges throughout Los Angeles and Orange County provide programs in entertainment studies. These include: Santa Monica, Pasadena, El Camino, Long Beach City College, and more. Visit the Los Angeles Orange County Regional Consortium website at **http://www.laocrc.com** to access individual websites of the 28 community colleges in Los Angeles and Orange Counties.