

# LABOR MARKET ANALYSIS

FOR PROGRAM RECOMMENDATION



C·O·E

CENTERS OF EXCELLENCE  
FOR LABOR MARKET RESEARCH

## GAME DEVELOPER TECHNOLOGIES IN THE GREATER SACRAMENTO REGION

North (Greater Sacramento)  
Center of Excellence

MAY 2024

# TABLE OF CONTENTS

- Summary ..... 3
- Introduction ..... 4
- Occupational Demand ..... 5
  - Wages ..... 7
- Job Postings ..... 8
  - About Job Postings Analysis ..... 8
  - Top Employers and Job Titles ..... 8
  - Top Skills and Qualifications ..... 11
- Education and Training Requirements ..... 13
- Educational Supply ..... 14
  - Community College Supply ..... 14
  - Other Postsecondary Supply ..... 16
- Findings ..... 17
- Recommendations ..... 19
- Appendix A. Methodology and Sources ..... 21
- Appendix B. Glossary ..... 22

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# SUMMARY

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The North (Greater Sacramento) Center of Excellence for Labor Market Research prepared this report to provide a labor market analysis of educational supply and occupational demand for middle-skilled careers in the North (Greater Sacramento) subregion. This report aims to determine if demand in the local labor market is unmet by the supply from existing community college programs and other postsecondary training providers.

This report primarily focuses on training that leads to jobs in middle-skilled occupations - jobs that typically require education beyond a high school diploma but less than a bachelor's degree - but may include higher-skilled occupations for training pathways that lead to a bachelor's degree. Lower skilled occupations are rarely considered in this analysis due to the lessened barriers for entry-level work, such as no formal education and fewer on-the-job training requirements.

Key findings include:

- In 2022, the Greater Sacramento subregion held more than 9,400 jobs in occupations related to game development. These jobs are projected to increase by 8% over the next five years, adding nearly 800 new jobs to the subregion by 2027.
- Over the next five years, jobs in occupations related to game development are projected to have nearly 706 annual openings in the Greater Sacramento subregion.
- Analysis of wage data shows that occupations related to game development earn entry-level hourly wages of \$1 to \$31 above the single adult living wage of \$18.72 per hour.
- Awards data analysis shows that North (Greater Sacramento) training providers conferred an average of 855 awards (including 631 bachelor's degrees) in related computer science programs over the last three academic years.

Recommendations include:

- The North (Greater Sacramento) Center of Excellence does not recommend developing a new program in game development technology at this time. Data analysis shows that while there is demand for software developers in general, we do not know enough about the demand for game developers specifically. Furthermore, game developer career opportunities seem confined to entrepreneurship or self-employment.
- Additional research is recommended before developing a new game developer technology program.

# INTRODUCTION

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The North (Greater Sacramento) Center of Excellence (COE) was asked to provide labor market information for a proposed program at a regional community college. This report focuses on the following Standard Occupational Classification (SOC) occupations and codes:

- These middle-skill occupations require more education and training beyond a high school diploma but usually less than a four-year degree:
  - Web and Digital Interface Designers (15-1255)
    - Video Game Designers (15-1255.01) is a subset of the web and digital interface designer occupation.
- Students who transfer and earn a four-year degree could pursue the following above middle skill occupations:
  - Computer Programmers (15-1251)
  - Software Developers (15-1252)
  - Software Quality Assurance Analysts and Testers (15-1253)

A review of related programs revealed the following Taxonomy of Programs (TOP) title(s) and code(s) are appropriate for inclusion in this report:

- Electronic Game Design (0614.20)
- Computer Graphics and Digital Imagery (0614.60)
- Information Technology, General (0701.00)
- Computer Information Systems (0702.00)
- Computer Software Development (0707.00)
- Computer Programming (0707.10)

The corresponding Classification of Instructional Program (CIP) title(s) and code(s) are:

- Computer Game Programming (11.0204)
- Computer and Information Sciences, General (11.0101)
- Computer Graphics (11.0803)
- Computer Software Technology/Technician (15.1204)
- Computer Science (11.0701)

# OCCUPATIONAL DEMAND

Exhibit 1 summarizes the five-year projected job growth for the studied occupations in North (Greater Sacramento)<sup>1</sup>, North/Far North, and California.

**Exhibit 1. Employment and projected demand, 2022-2027**

Occupation	2022 Jobs	2027 Jobs	2022-2027 Change	2022-2027 % Change	2022-2027 Annual Openings
Software Developers	6,873	7,577	704	10%	520
Software Quality Assurance Analysts and Testers	1,117	1,173	56	5%	82
Computer Programmers	763	740	(22)	(3%)	46
Web and Digital Interface Designers	709	750	41	6%	59
<b>North (Greater Sacramento)</b>	<b>9,461</b>	<b>10,240</b>	<b>778</b>	<b>8%</b>	<b>706</b>
Software Developers	7,418	8,225	807	11%	571
Software Quality Assurance Analysts and Testers	1,273	1,335	63	5%	93
Computer Programmers	898	869	(29)	(3%)	54
Web and Digital Interface Designers	875	923	47	5%	73
<b>North/Far North</b>	<b>10,464</b>	<b>11,352</b>	<b>888</b>	<b>8%</b>	<b>792</b>
Software Developers	269,220	310,427	41,207	15%	23,395
Software Quality Assurance Analysts and Testers	33,342	37,474	4,131	12%	2,975
Web and Digital Interface Designers	23,931	25,939	2,008	8%	2,169

<sup>1</sup> The North (Greater Sacramento) subregion covers seven counties, including El Dorado, Nevada, Placer, Sacramento, Sutter, Yolo, and Yuba.

Occupation	2022 Jobs	2027 Jobs	2022-2027 Change	2022-2027 % Change	2022-2027 Annual Openings
Computer Programmers	21,765	21,320	(445)	(2%)	1,392
<b>California</b>	<b>348,259</b>	<b>395,161</b>	<b>46,902</b>	<b>13%</b>	<b>29,931</b>

Exhibit 2 compares the net changes in jobs between 2017 through 2022 and the projected changes through 2027. The rate of change is indexed to the total number of jobs in 2017.

**Exhibit 2. Changes in employment, 2017-2027**

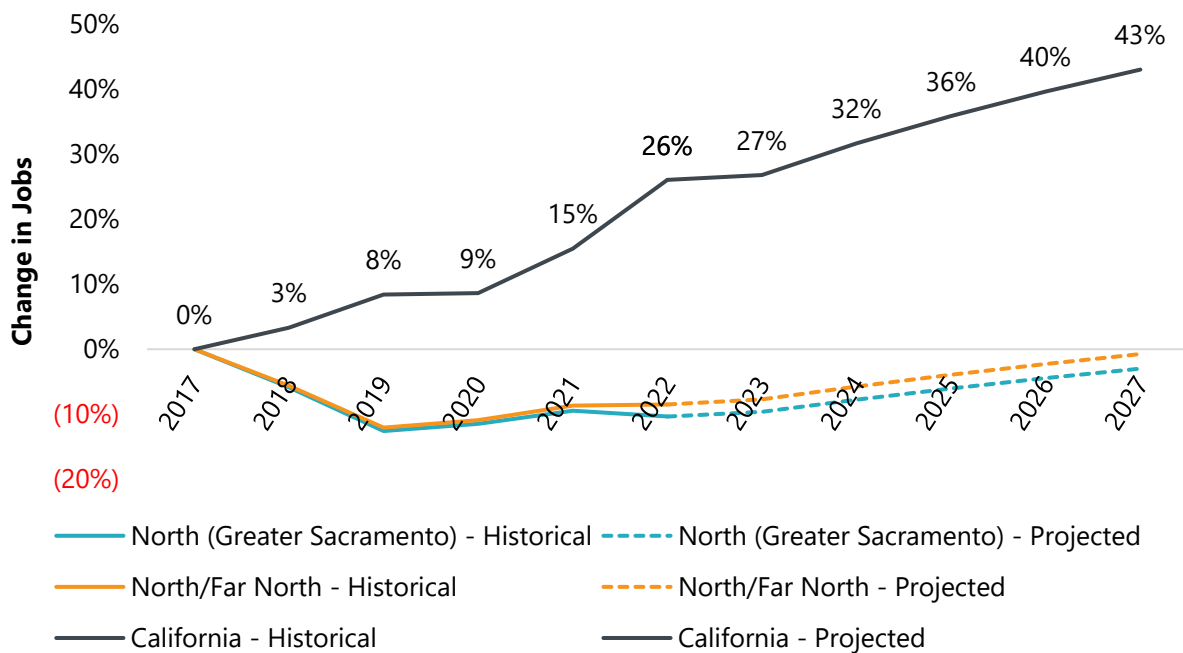


Exhibit 3 shows the top industries for employment of the studied occupations. The industries marked with an asterisk (\*) are most likely to be used by companies in the video game industry.<sup>2</sup>

**Exhibit 3. Top Industries of Employment, 2022**

NAICS Code	NAICS Industry	2022 Jobs	Share of 2022 Jobs
541511	Custom Computer Programming Services*	1,207	13%

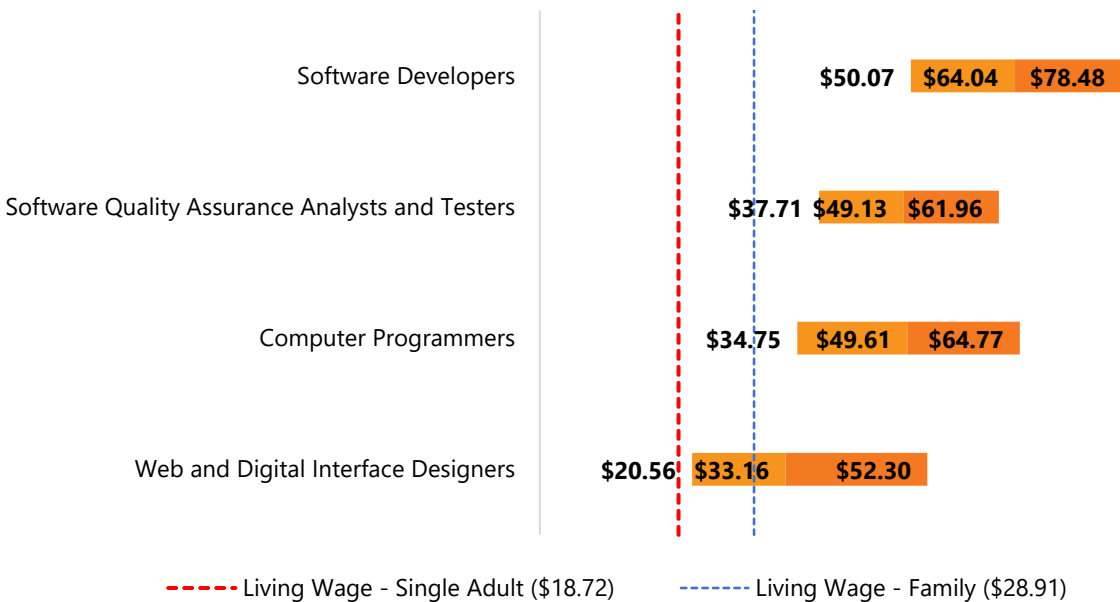
<sup>2</sup> Lisa DeNight, "The Gaming Industry, Esports & CRE (Commercial Real Estate): Not Just Playing Around," September 2018, published on LinkedIn, <https://www.linkedin.com/pulse/gaming-industry-esports-cre-just-playing-around-lisa-denight/>, accessed May 9, 2024.

NAICS Code	NAICS Industry	2022 Jobs	Share of 2022 Jobs
541512	Computer Systems Design Services	1,051	11%
902999	State Government, Excluding Education and Hospitals	963	10%
551114	Corporate, Subsidiary, and Regional Managing Offices	472	5%
513210	Software Publishers*	373	4%
	All Other Industries	5,396	57%
<b>Greater Sacramento Totals</b>		<b>9,461</b>	<b>100%</b>

## Wages

Exhibit 4 compares the 25<sup>th</sup> percentile, median, and 75<sup>th</sup> percentile hourly wages for the selected occupations to the Greater Sacramento living wage for one working adult (\$18.72 per hour) and a small family (\$28.91 per hour).<sup>3,4</sup> The 25<sup>th</sup> and 75<sup>th</sup> percentile hourly wages are used to estimate entry-level and experienced worker wages.

### Exhibit 4. Hourly wages by occupation, 2022



<sup>3</sup> Living wage is defined as the level of income one working adult with no children must earn to meet basic needs, including food, housing, transportation, healthcare, taxes, and other miscellaneous basic needs. Please note that the 25th-percentile and 75th-percentile hourly wages are used as proxy for entry-level and experienced-level wages.

<sup>4</sup> A small family is defined as one working adult and one school aged child (between the ages of 5 and 12 years).

# JOB POSTINGS

## About Job Postings Analysis

This section analyzes recent data from online job postings. Online job postings may provide additional insight into recent changes in the labor market that are not captured by historical trends. However, job postings are not the same as labor market demand; demand is based on projected annual openings. Job postings should be used to inform community college curriculum development and identify potential employers for targeted experiential learning opportunities.

Please note several limitations to analyzing and interpreting online job postings. Employers may post a position multiple times to increase the number of job applicants. Job postings may remain online after a business chooses not to fill a position. Employers may advertise one posting to fill multiple vacancies. And not all jobs are posted online.

The North COE identified 2,412 online job postings for the selected occupations in the seven-county Greater Sacramento subregion. Job posting data comes from Lightcast (formerly Emsi Burning Glass) and represents unique advertisements newly posted online during the last 12 months, from May 2023 through April 2024.

## Top Employers and Job Titles

Exhibit 5 details the number of online job postings for the selected occupations.

**Exhibit 5. Job postings by occupation**

Occupation	Unique Job Postings	Share of Job Postings
Software Developers	1,981	82%
Web and Digital Interface Designers	172	7%
Software Quality Assurance Analysts and Testers	147	6%
Computer Programmers	112	5%
<b>Total Job Postings</b>	<b>2,412</b>	<b>100%</b>



Exhibit 6 shows the top 10 industries, by 6-digit NAICS code title, with the most job postings. The industries marked with an asterisk (\*) are most likely to be used by companies in the video game industry.

**Exhibit 6. Top industries with the most job postings**

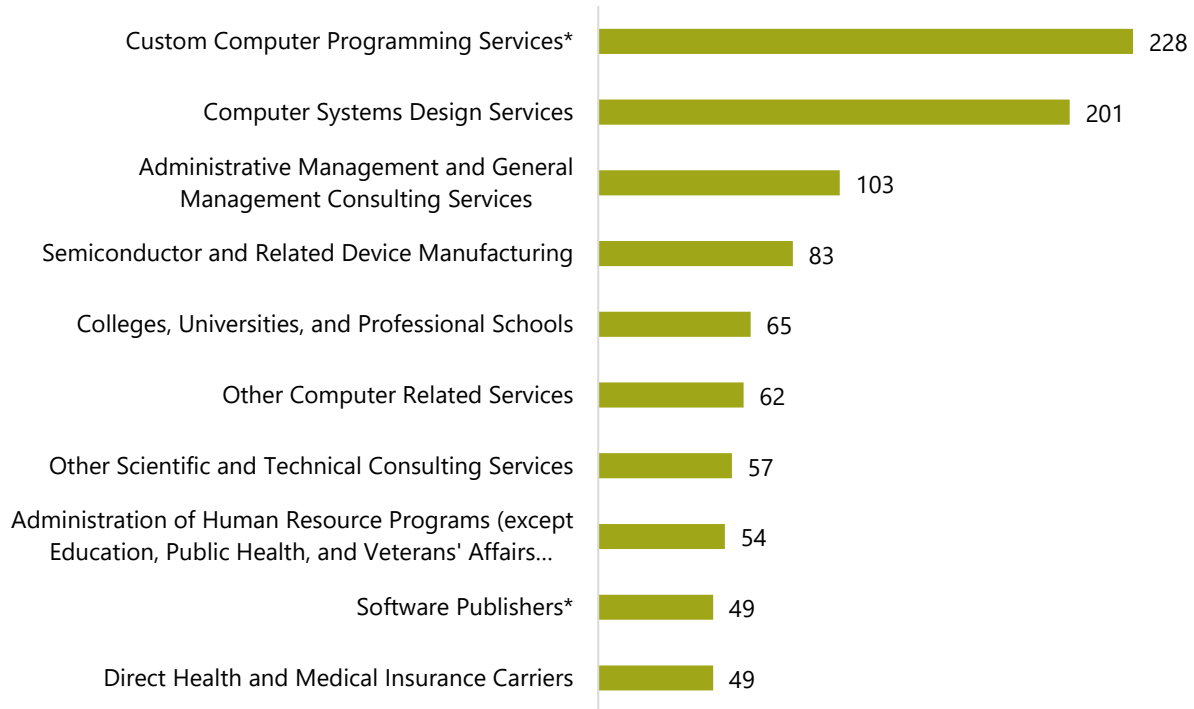


Exhibit 7 shows the top 10 relevant employers with the most job postings for the selected occupations. *There were no job postings from game development companies.*

**Exhibit 7. Top Employers with the most job postings**

Employer	Number of Job Postings
Intel	77
University of California	57
California Public Employees' Retirement System	53
Deloitte	51
Agile Global Solutions	48
Accenture	45

Employer	Number of Job Postings
State of California	29
Gainwell Technologies	28
West Advanced Technologies	27
Sutter Health	26

Exhibit 8 shows the top 10 relevant job titles with the most job postings.

**Exhibit 8. Top job titles with the most job postings**

Job Title	Number of Job Postings
Software Engineers	120
.NET Developers	63
Software Developers	53
Business Intelligence Developers	52
Application Developers	44
Solutions Architects	37
Salesforce Developers	26
Full Stack Developers	24
Embedded Software Engineers	20
UX Designers	19

## Top Skills and Qualifications

Exhibit 9 shows the most relevant certifications requested by employers for the selected occupations.

### Exhibit 9. Most in-demand certifications

Certification	Number of Job Postings
Security Clearance	61
Top Secret-Sensitive Compartmented Information (TS/SCI Clearance)	37
Certified Information Systems Security Professional	26
CompTIA Security+	20

Exhibit 10 shows the top 10 skills across three categories for the studied occupations: specialized, essential, and software skills.<sup>5</sup>

### Exhibit 10. Most in-demand skills

Specialized Skills	Common Skills	Software Skills
Computer Science	Communication	SQL (Programming Language)
SQL (Programming Language)	Management	JavaScript (Programming Language)
Agile Methodology	Problem-Solving	Application Programming Interface (API)
JavaScript (Programming Language)	Troubleshooting (Problem-Solving)	Python (Programming Language)
Software Development	Leadership	C# (Programming Language)
Software Engineering	Operations	Amazon Web Services
Application Programming Interface (API)	Writing	Java (Programming Language)

<sup>5</sup> Specialized skills are those primarily required to perform specific tasks in an occupation. Essential skills are typically related to employability. These are skills that are prevalent across many occupations and include both interpersonal attributes and learned skills (aka "soft skills"). Software skills are specific to any software tool or programming component used to support a job.

Specialized Skills	Common Skills	Software Skills
Python (Programming Language)	Information Technology	Microsoft Azure
C# (Programming Language)	Planning	Cascading Style Sheets (CSS)
Amazon Web Services	Customer Service	HyperText Markup Language (HTML)

Exhibit 11 shows the minimum education level preferred by employers for related job postings in the Greater Sacramento subregion.<sup>6</sup>

**Exhibit 11. Employer-preferred education**

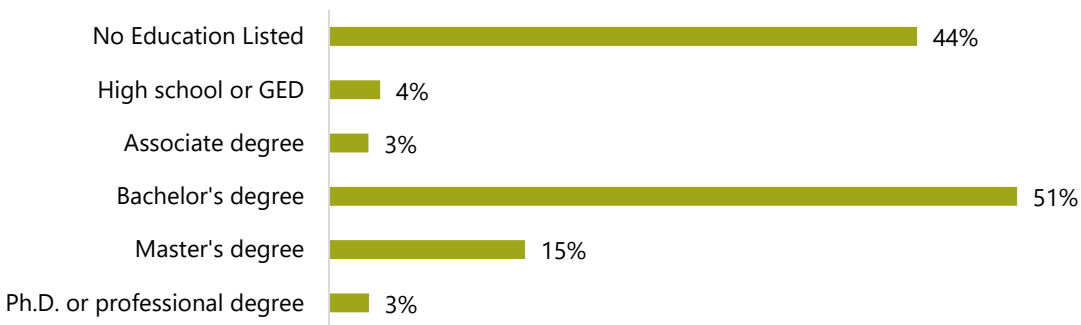
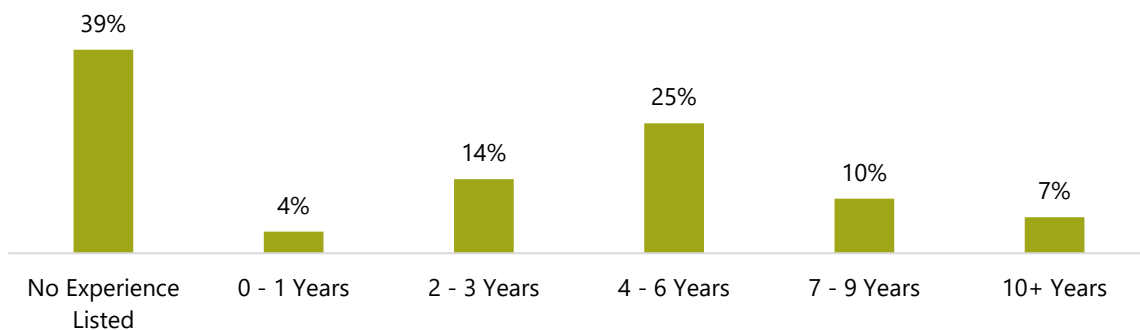


Exhibit 12 shows the minimum level of experience employers prefer for related job postings in the Greater Sacramento subregion.<sup>7</sup>

**Exhibit 12. Employer-preferred job experience**



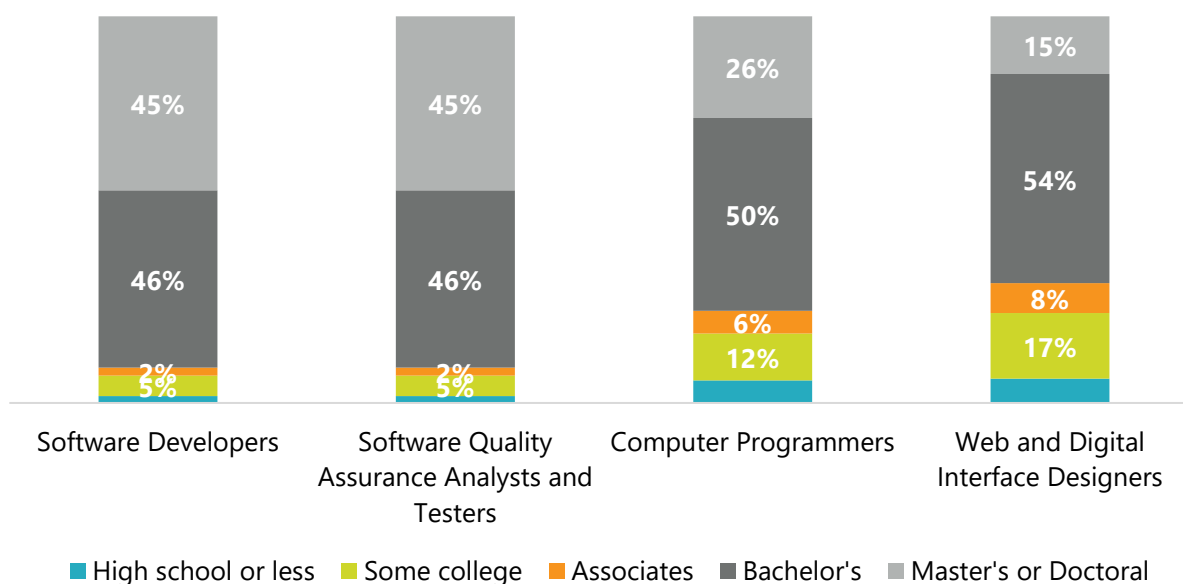
<sup>6</sup> Employers may include more than one level of education as a hiring requirement in a job posting. As a result, the values in exhibit 9 may sum to greater than 100%.

<sup>7</sup> Employers may include more than one level of experience as a hiring requirement in a job posting. As a result, the values in exhibit 10 may sum to greater than 100%.

## EDUCATION AND TRAINING REQUIREMENTS

The U.S. Census Bureau collects data on the highest education level achieved by workers across all occupations. Exhibit 13 shows California's educational attainment of the current workforce in the selected occupations.

**Exhibit 13. California educational attainment for selected occupations, 2019**



The U.S. Bureau of Labor Statistics (BLS) uses a categorical system to assign typical entry-level education and job requirements to each occupation for which the BLS publishes projection data. These categories include entry-level education, work experience in a related occupation, and on-the-job training. Exhibit 14 shows the selected occupations' typical entry-level job requirements.

**Exhibit 14. Typical entry-level job requirements**

Occupation	Entry-level Education Requirements	Work Experience Requirements	On-The-Job Training Requirements
Software Developers	Bachelor's degree	None	None
Software Quality Assurance Analysts and Testers	Bachelor's degree	None	None
Computer Programmers	Bachelor's degree	None	None
Web and Digital Interface Designers	Bachelor's degree	None	None

## EDUCATIONAL SUPPLY

Educational supply for an occupation can be estimated by analyzing the number of awards issued in related Taxonomy of Programs (TOP) or Classification of Instructional Programs (CIP) codes. Exhibit 15 shows the TOP and CIP codes for educational programs related to the selected occupations.

**Exhibit 15. TOP and CIP codes for training programs related to the selected occupations**

TOP Programs and Codes	Aligned CIP Programs and Codes
<ul style="list-style-type: none"> <li>Electronic Game Design (0614.20)</li> <li>Computer Graphics and Digital Imagery (0614.60)</li> <li>Information Technology, General (0701.00)</li> <li>Computer Information Systems (0702.00)</li> <li>Computer Software Development (0707.00)</li> <li>Computer Programming (0707.10)</li> </ul>	<ul style="list-style-type: none"> <li>Computer Game Programming (11.0204)</li> <li>Computer and Information Sciences, General (11.0101)</li> <li>Computer Graphics (11.0803)</li> <li>Computer Software Technology/Technician (15.1204)</li> <li>Computer Science (11.0701)</li> </ul>

### Community College Supply

Exhibits 16 and 17 compare the average number of certificates and degrees from selected Greater Sacramento community college programs over the last three academic years.

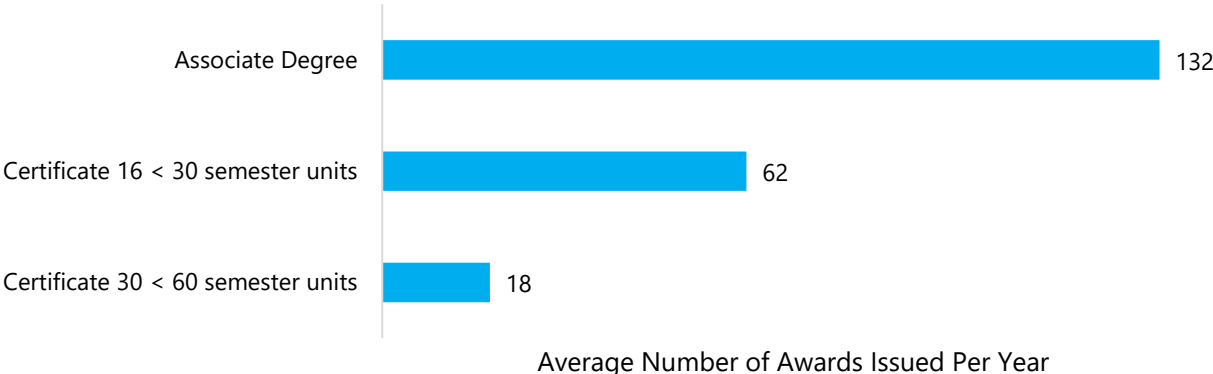
**Exhibit 16. Annual average community college awards by program**

Program - TOP Code	College	Annual Awards 2020-21	Annual Awards 2021-22	Annual Awards 2022-23	3-Yr Annual Awards Average
Electronic Game Design (0614.20)	Sacramento City	5	2	12	6
	<b>Subtotal</b>	<b>5</b>	<b>2</b>	<b>12</b>	<b>6</b>
Computer Graphics and Digital Imagery (0614.60)	American River	5	9	2	5
	<b>Subtotal</b>	<b>5</b>	<b>9</b>	<b>2</b>	<b>5</b>

Program - TOP Code	College	Annual Awards 2020-21	Annual Awards 2021-22	Annual Awards 2022-23	3-Yr Annual Awards Average
Computer Information Systems (0702.00)	Cosumnes River	9	9	10	9
	Sacramento City	13	14	16	14
	Sierra	4	2	3	3
	<b>Subtotal</b>	<b>26</b>	<b>25</b>	<b>29</b>	<b>27</b>
Computer Programming (0707.10)	American River	27	29	29	25
	Cosumnes River	15	18	14	16
	Folsom Lake	11	19	12	14
	Sacramento City	14	9	12	12
	Sierra	33	26	30	30
	Yuba	3	25	32	20
	<b>Subtotal</b>	<b>103</b>	<b>126</b>	<b>129</b>	<b>119</b>
Computer Software Development (0707.00)	Cosumnes River	2	2	3	2
	Folsom Lake	-	1	-	0
	Sacramento City	26	11	21	19
	<b>Subtotal</b>	<b>28</b>	<b>14</b>	<b>24</b>	<b>22</b>
Information Technology, General (0701.00)	Cosumnes River	18	28	33	26
	Folsom Lake	5	11	5	7
	<b>Subtotal</b>	<b>23</b>	<b>39</b>	<b>38</b>	<b>33</b>
	<b>Grand Total</b>	<b>190</b>	<b>215</b>	<b>234</b>	<b>224</b>

Note: Values in the table are rounded to the nearest whole number. However, subtotals and totals are calculated using unrounded values.

**Exhibit 17. Annual average community college awards by type, 2019-20 through 2021-22**



**Other Postsecondary Supply**

Exhibit 18 compares the average number of degrees that non-community college training providers conferred in the Greater Sacramento subregion over the last three academic years (from 2019-20 through 2021-22). Please note that non-community college award data often lags by one year.

**Exhibit 18. Other postsecondary awards by program, 2019-20 through 2021-22**

Program - CIP Code	Provider	Three-Year Average Awards		Totals
		Bachelor's	Graduate	
Computer Science (11.0701)	UC Davis	361	85	446
	CSU Sacramento	266	42	308
	William Jessup	4	9	13
<b>Grand Total</b>		<b>631</b>	<b>136</b>	<b>767</b>



# FINDINGS

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The Game Developer Technologies, or game development, career pathway is focused on providing students with the knowledge and skills necessary to produce video games, including game engines, programming, 3D modeling tools and methods, animation tools and techniques, VR headsets, and controllers. According to Forbes, game development is distinct from game design. Game development focuses on the technical aspects, such as writing the code and managing the overall game production process from start to finish. In contrast, game design is the creative aspect of game development. However, the disciplines often overlap, as programs for game design sometimes include programming and game development coursework.

This report focuses on four occupations related to the Game Developer Technologies career pathway: web and digital interface designers (15-1255), computer programmers (SOC 15-1251), software developers (15-1252), and software quality assurance analysts and testers (15-1253).

## *Occupational Demand*

- In 2022, the Greater Sacramento subregion held more than 9,400 jobs in occupations related to game development. These jobs are projected to increase by 8% over the next five years, adding nearly 800 new jobs to the subregion by 2027.
  - Most of the projected job growth is estimated to come from the software developer occupation. This occupation alone will increase by 704 jobs in the next five years.
- Jobs related to game developer technologies are projected to grow slower in the Greater Sacramento subregion than in California, at 8% and 13%, respectively. Furthermore, Greater Sacramento's employment in these occupations remains 12% below 2017 levels.
- Over the next five years, jobs in occupations related to game development are projected to have nearly 706 annual openings in the Greater Sacramento subregion.
- In 2022, the top five industries for employment of occupations related to game development included custom computer programming services (13%), computer systems design services (11%), state government (10%), corporate, subsidiary, and regional managing offices (5%), and software publishers (4%).
  - According to a LinkedIn article, custom computer programming services (NAICS 541511) and software publishers (NAICS 513210) are two critical industries for game development as they are the most frequently used industry codes by companies in the video game industry.<sup>8</sup>

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<sup>8</sup> Lisa DeNight, "The Gaming Industry, Esports & CRE (Commercial Real Estate): Not Just Playing Around," September 2018, published on LinkedIn, <https://www.linkedin.com/pulse/gaming-industry-esports-cre-just-playing-around-lisa-denight/>, accessed May 9, 2024.

## *Wages*

- Analysis of wage data shows that occupations related to game development earn entry-level hourly wages of \$1 to \$31 above the single adult living wage of \$18.72 per hour.

## *Job Postings*

- In the last 12 months, there were 2,412 online job postings for jobs related to game development occupations. Local game development companies did not appear in the job postings.
- Industries with the most job postings included custom computer programming services (228 postings), computer systems design services (201), administrative management and general management consulting services (103), and semiconductor manufacturing (83).
- Local employers seem to prefer job candidates to hold a bachelor's degree. Fifty-one percent of job postings listed a bachelor's degree as the minimum level of education required. In contrast, only 7% of job postings included an education level up to an associate degree.

## *Education and Training Requirements*

- In California, between 7% and 25% of current game development-related workers have educational attainment levels consistent with community college offerings (some college or associate degrees).<sup>9</sup>
  - Incumbent computer programmers (18%) and web and digital interface designers (25%) are more likely to have attended some college or earned an associate degree compared to software developers (7%) and software quality assurance analysts and testers (7%).<sup>10</sup>
- Between 46% and 54% of current workers in these occupations hold a bachelor's degree, while another 15% to 45% of the workforce have graduate-level degrees.<sup>11</sup>
- A bachelor's degree is the typical entry-level education required for employment in these occupations.

## *Postsecondary Supply*

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<sup>9</sup> The educational attainment for this group of workers looks different at the national level. In 2019, between 11% and 22% of the nation's incumbent workers in these occupations have community college related credentials. Source: Bureau of Labor Statistics, Educational attainment for workers 35 years and older, <https://www.bls.gov/emp/tables/educational-attainment.htm>, accessed May 9, 2024.

<sup>10</sup> Across the US, computer programmers (21%) and software quality assurance analysts and testers (22%) were more likely to have attended some college or have an associate degree. Source: Bureau of Labor Statistics, Educational attainment for workers 35 years and older.

<sup>11</sup> Between 50-51% of the US workforce employed in the three studied occupations held a bachelor's degree, while another 22-35% held graduate-level credentials. Source: Bureau of Labor Statistics, Educational attainment for workers 35 years and older.

- In Greater Sacramento, there are multiple training pathways for careers in the occupations related to game development.
- Six Greater Sacramento community colleges offer degrees and certificates in programs related to the three occupations. These programs conferred an average of 224 awards (certificates and associate degrees) in multiple computer and information science programs over the last three academic years (2020-21 through 2022-23).
  - Approximately six awards came from the electronic game design (TOP code 0614.20) program.
  - For a complete list of awards data by program, see Exhibit 16.
- Local four-year colleges and universities offer bachelor's degrees in programs related to game developer occupations. Between 2019-20 and 2021-22, four-year institutions conferred an average of 631 bachelor's degrees (and 136 graduate awards) in computer science programs over the last three years. Please note that non-community college awards data often lags by one year.

## RECOMMENDATIONS

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- A comparison of annual job openings to average annual awards from all institutions suggests a slight oversupply of workers in occupations related to game development in Greater Sacramento.
  - There are 706 projected annual openings for jobs in occupations related to game development.
  - Community colleges and four-year institutions issued an average of 855 awards, 631 of which were bachelor's degrees, over the last three years.
  - Workers are slightly undersupplied for these jobs if community college awards are excluded.
- This report alone does not provide sufficient evidence to support the development of a career education program for game developer technologies.
  - The demand for game developers is most likely overestimated because the occupations used to estimate demand include jobs outside game development.
  - While the industries most likely to host game developer companies rank in the top five for industries with the most employment of the studied occupational group (see exhibits 3 and 6), the proportion of employment from game developers is unknown.

- Job posting data is heavily weighted towards large employers outside the game development industry looking for job candidates with software development skills -skills that overlap with those required for game development. These companies include Intel, the University of California, CalPERS, and Deloitte.
- Furthermore, a well-known game developer in the area, EA Capital Games, did not show up in the job postings, and no other game developer companies were identified in the job postings.
- A 2017 article in [Comstock magazine](#) suggested that despite challenges, Greater Sacramento's indie game developers were making gains in building up the industry through entrepreneurship, implying that access to work within this industry may primarily occur through self-employment.
- The North (Greater Sacramento) Center of Excellence does not recommend developing a new program in game development technology.
  - Analysis of the data shows that while there is demand for software developers in general, we do not know enough about the market for game developers specifically.
  - Additional research is recommended.

New Program Recommendation		
<b>Move forward with the new program</b>	<b>Proceed with caution</b>	<b>A new program is not recommended</b>
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

## APPENDIX A. METHODOLOGY AND SOURCES

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This report identified Occupations using the Center of Excellence TOP-to-CIP-to-SOC crosswalk and O\*Net OnLine. This report's findings were determined using labor market data from the Bureau of Labor Statistics (BLS), U.S. Census Bureau data from Emsi, and jobs posting data from Burning Glass.

"The Chancellor's Office Curriculum Inventory System (COCI)." California Community Colleges Curriculum Inventory (COCI), 2023. <https://coci2.ccctechcenter.org/>.

Glasmeier, Amy K. "Living Wage Calculator." Living Wage Calculator, 2023. <https://livingwage.mit.edu/>.

Integrated Postsecondary Education Data System (IPEDS). National Center for Education Statistics. U.S. Department of Education. <https://nces.ed.gov/ipeds/>.

Labor Market Information Division. California Employment Development Department. <https://labormarketinfo.edd.ca.gov/>.

Lightcast (Formerly EMSI/Burning Glass) 2024.1; QCEW Employees, Non-QCEW Employees, and Self-Employed. <https://www.economicmodeling.com/>. (Note: EMSI occupational employment data are based on final EMSI industry data and final EMSI staffing patterns. Wage estimates are based on Occupational Employment Statistics (QCEW and Non-QCEW Employees classes of worker) and the American Community Survey (Self-Employed and Extended Proprietors)).

Management Information Systems (MIS) Data Mart. California Community Colleges Chancellor's Office. <https://datamart.cccco.edu/>.

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Self-Sufficiency Standard Tool for California. The University of Washington. <http://www.selfsufficiencystandard.org/>

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## APPENDIX B. GLOSSARY

Key Terms	Definition
<b>Occupation</b>	<p>Occupation refers to a category of jobs, careers, or professions that are similar regarding the work performed and the skills the workers possess. Workers who perform essentially the same tasks are in the same occupation, whether in the same industry. Some occupations are concentrated in a few industries, while others are found in many industries.</p> <p>Occupations differ from jobs in that jobs show the number of positions held in each occupation.</p>
<b>Jobs</b>	<p>A job is a specific instance of employment and includes any position where a worker provides labor for monetary compensation.</p> <p>Job numbers include employees (those who work for businesses) and proprietors (those who work for themselves). Full- and part-time jobs are included and counted equally (i.e., not adjusted to full-time equivalents). Data for jobs, or employment, are annual averages.</p>
<b>Employment</b>	<p>Employment refers to filled jobs, whether full- or part-time, temporary or permanent. The scope of "who" is counted as employed is noted in Appendix A. Methodology and Sources.</p>
<b>Job Change</b>	<p>Job change is the net increase or decrease of jobs over a given timeframe.</p>
<b>Job Opening</b>	<p>Job openings are the projected number of positions available for workers entering an occupation.</p> <p>Openings include growth and replacement job counts. Growth job counts are the positive change in the total number of workers employed. Replacement job counts are the estimates of new workers needed to replace workers permanently leaving the occupation.</p>
<b>Percentile Wage (or wages)</b>	<p>A percentile wage is the value of a wage at which a certain percentage of workers falls below. For example, a 25<sup>th</sup> percentile hourly wage of \$15.00 indicates that 25% of workers earn less than \$15.00, while 75% earn more. Percentile wages are specific to the geography shown in the report.</p> <p>The 25th-percentile and 75th-percentile hourly wages are used as a proxy for entry-level and experienced-level wages.</p>
<b>Living Wage</b>	<p>The living wage is the level of income a single, working adult with no children must earn to meet basic needs. The living wage is calculated using basic allowances for food, housing, transportation, healthcare, taxes, and other miscellaneous basic needs, and assumes full-time employment (40 hours per week, 52 weeks a year).</p>

Key Terms	Definition
	Beginning in 2023-24, NFN COE adopted the MIT calculations for a living wage better aligned to the economic conditions following the pandemic. For additional information, please visit <a href="https://livingwage.mit.edu/">https://livingwage.mit.edu/</a> .
<b>Educational Attainment</b>	Educational attainment is the highest level of education achieved by workers in an occupation. The data include workers aged 25 years and older.
<b>Typical Entry-level Education</b>	<p>The education level most workers need to gain employment in an occupation. Categories range from "no formal educational credential" and "high school diploma or equivalent" to "doctoral or professional degree." The types most relevant to community training are "some college, no degree," "postsecondary nondegree award," and "associate degree."</p> <p>The typical entry-level education may differ from the actual educational levels attained by workers employed in an occupation.</p>
<b>Typical Work Experience</b>	The relevant prior experience a worker needs to gain employment in an occupation. Categories include "5 years or more", "less than five years," and "none."
<b>Typical On-The-Job (OTJ) Training</b>	The level of on-the-job training a worker needs to obtain for competency in the skills required for an occupation. Categories include "none," "short-term (1 month or less)," "moderate-term (more than one month but less than 12 months)," "long-term (more than 12 months)," "apprenticeship," and "internship/residency."
<b>Awards</b>	Awards are the number of certificates and degrees conferred for a specific course of study each year. Awards count "papers" and, as a result, may be greater than the number of students who complete a program.

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**COVID-19 Statement:** This report includes employment projection data produced by Lightcast (formerly EMSI). Employment projections are developed using models based on historical data, which in this set of projections covers the period through 2021. Most input data, therefore, precedes the pandemic. Employment projections are long-term projections intended to capture structural changes in the economy, not cyclical fluctuations. As such, projections data are not intended to capture the impacts of the recession that began in February 2020. Cyclical fluctuations, like recessions, impact projections when they become part of the historical data set.

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