

Summary

Program LMI Endorsement	Endorsed: All LMI Criteria Met <input checked="" type="checkbox"/>	Endorsed: Some LMI Criteria Met <input type="checkbox"/>	Not LMI Endorsed <input type="checkbox"/>
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Program LMI Endorsement Criteria

	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Supply Gap:	<i>Comments:</i> there is projected to be 922 middle-skill annual job openings throughout Los Angeles and Orange counties for these middle-skill multimedia occupations, which is more than the 180 awards conferred by educational institutions.	
Living Wage: (Entry-Level, 25 th)	<i>Comments:</i> all annual job openings for these middle-skill multimedia occupations have entry-level hourly wages above the OC living wage of \$20.63.	
Education:	<i>Comments:</i> All annual job openings for these middle-skill multimedia occupations typically require a bachelor's degree. However, a significant number of workers in the field have completed some college or an associate degree as their highest level of education.	

Emerging Occupation(s)

Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
<i>Comments:</i> The metaverse is an emerging and developing area. In broad terms, the metaverse is a virtual universe created by computer software. Users can interact with the metaverse through the use of augmented and virtual reality (AR and VR) technology. Though the occupations analyzed throughout this report are well established, they are most closely related with the design, art, and user experience elements of the metaverse.	

The Orange County Center of Excellence for Labor Market Research (OC COE) prepared this report to determine whether there is a supply gap in the Los Angeles/Orange County regional labor market related to four multimedia occupations:

- Middle-Skill
 - Web Developers (15-1254)
 - Web and Digital Interface Designers (15-1255)
- Above Middle-Skill – denoted with an asterisk (*) throughout this report.
 - Special Effects Artists and Animators (27-1014)*
 - Graphic Designers (27-1024)*

Middle-skill occupations typically require a community college education while above middle-skill occupations typically require at least a bachelor's degree.

Based on the available data, there appears to be a supply gap for these middle-skill multimedia occupations in the region and all annual job openings have entry-level wages above the living wage. Though these occupations typically require a bachelor's degree, a significant number of workers in the field have completed some college or an associate degree as their highest level of education. **Therefore, due to all of the regional labor market criteria being met, the COE endorses this proposed program.**

Exhibit 1 lists the occupational demand, supply, typical entry-level education, and educational attainment for the occupations included in this report.

Exhibit 1: Occupational Demand and Supply in Los Angeles/Orange Counties

Occupation (SOC)	Demand (Annual Openings)	Supply (CC and Non-CC)	Entry-Level Hourly Earnings (25 th Percentile)	Typical Entry-Level Education	Community College Educational Attainment
Web Developers (15-1254)	492	122	LA: \$24.13 OC: \$22.46	Bachelor's degree	25%
Web and Digital Interface Designers (15-1255)	431	58	LA: \$24.45 OC: \$22.67	Bachelor's degree	25%
Middle-Skill Total	922	180	N/A	N/A	N/A
Special Effects Artists and Animators (27-1014)*	814	602	LA: \$23.70 OC: \$15.46	Bachelor's degree	27%
Graphic Designers (27-1024)*	1,823	615	LA: \$20.64 OC: \$20.50	Bachelor's degree	26%
Above Middle-Skill Total	2,636	1,217	N/A	N/A	N/A
Total	3,559	1,397	N/A	N/A	N/A

Demand:

- The number of jobs related to these middle-skill multimedia occupations are projected to increase 6% through 2026; there is projected to be 922 annual job openings due to retirements and replacements.
- Hourly entry-level wages for these middle-skill multimedia occupations range from \$22.46 to \$23.67 in Orange County; all annual job openings have entry-level wages above the living wage.
- There were 12,282 online job postings for these middle-skill multimedia occupations over the past 12 months. The highest number of postings were for front-end developers, UI/UX designers, and front-end engineers.
- The typical entry-level education for these middle-skill multimedia occupations ranges is a bachelor's degree.
- Approximately 25% of workers in these middle-skill occupations have completed some college or an associate degree as their highest level of educational attainment.

Supply:

- There was an average of 635 awards conferred by 26 community colleges in Los Angeles and Orange Counties from 2018 to 2021.
- There was an average of 762 awards conferred by 27 non-community college institutions from 2017 to 2020.
- Orange County community college students that exited multimedia programs in the 2018-2019 academic year had a median annual wage of \$25,050 after exiting the program and 31% attained the regional living wage.
- Throughout Orange County, 40% of multimedia students that exited their program in 2017-18 reported that they are working in a job closely related to their field of study.

Demand

Occupational Projections:

Exhibit 2 shows the annual percent change in jobs for all four of the multimedia occupations researched in this report from 2016 through 2026. Notably, employment in these multimedia occupations in Orange County increased 1% from 2019 to 2020 while employment across all occupations in Los Angeles and Orange Counties declined 7% due to the COVID-19 pandemic.

Employment in all four of these multimedia occupations is projected to continue to increase at a slightly higher rate than all occupations through 2026. Employment in the middle-skill occupations is projected to increase at a higher rate than the above middle-skill occupations.

Exhibit 2: Annual Percent Change in Jobs for
Multimedia Occupations, 2016-2026

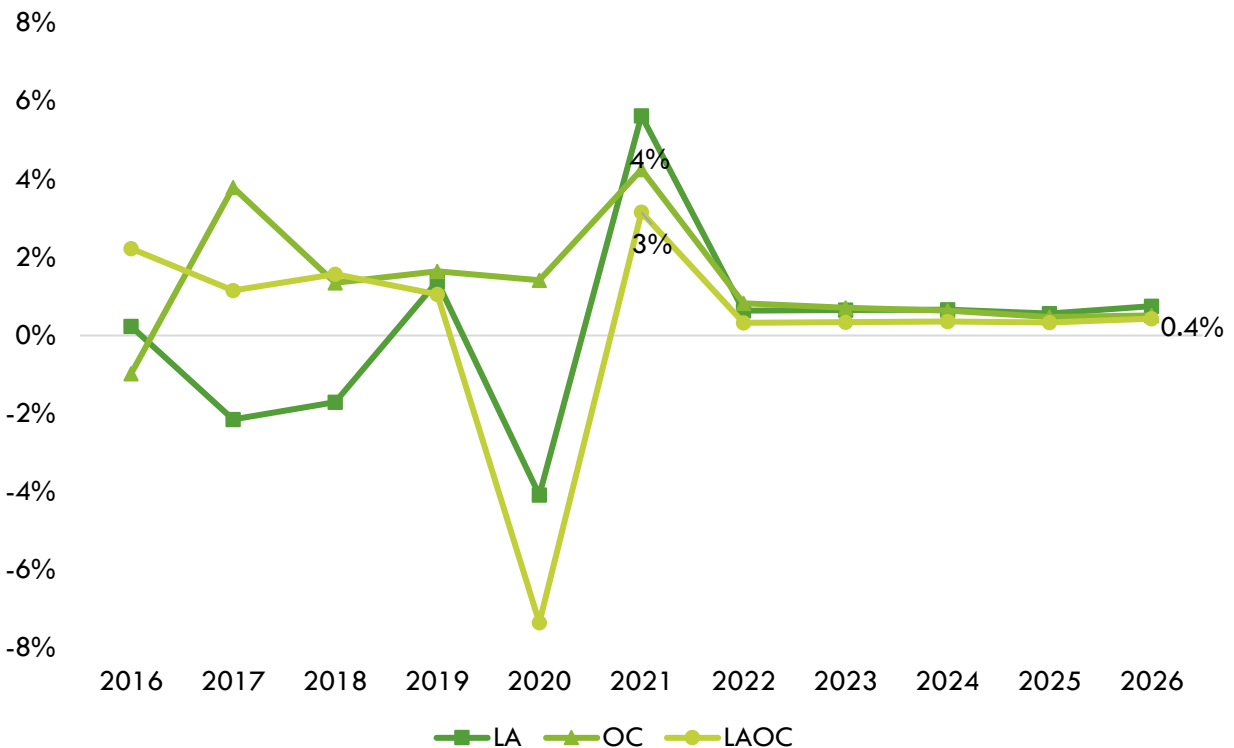


Exhibit 3 shows the five-year occupational demand projections for these middle-skill multimedia occupations. In Los Angeles/Orange County, the number of jobs related to these occupations is projected to increase 6% through 2026. There is projected to be 922 jobs available annually.

Exhibit 3: Middle-Skill Occupational Demand in Los Angeles and Orange Counties¹

Geography	2021 Jobs	2026 Jobs	2021-2026 Change	2021-2026 % Change	Annual Openings
Los Angeles	7,938	8,403	465	6%	680
Orange	2,918	3,058	140	5%	243
Total	10,856	11,461	606	6%	922

Exhibit 4 shows the five-year occupational demand projections for these above middle-skill multimedia occupations. In Los Angeles/Orange County, the number of jobs related to these occupations is projected to increase by 2% through 2026. There is projected to be 2,636 jobs available annually.

Exhibit 4: Above Middle-Skill Occupational Demand in Los Angeles and Orange Counties

Geography	2021 Jobs	2026 Jobs	2021-2026 Change	2021-2026 % Change	Annual Openings
Los Angeles	20,818	21,302	484	2%	2,118
Orange	5,338	5,462	124	2%	518
Total	26,156	26,764	607	2%	2,636

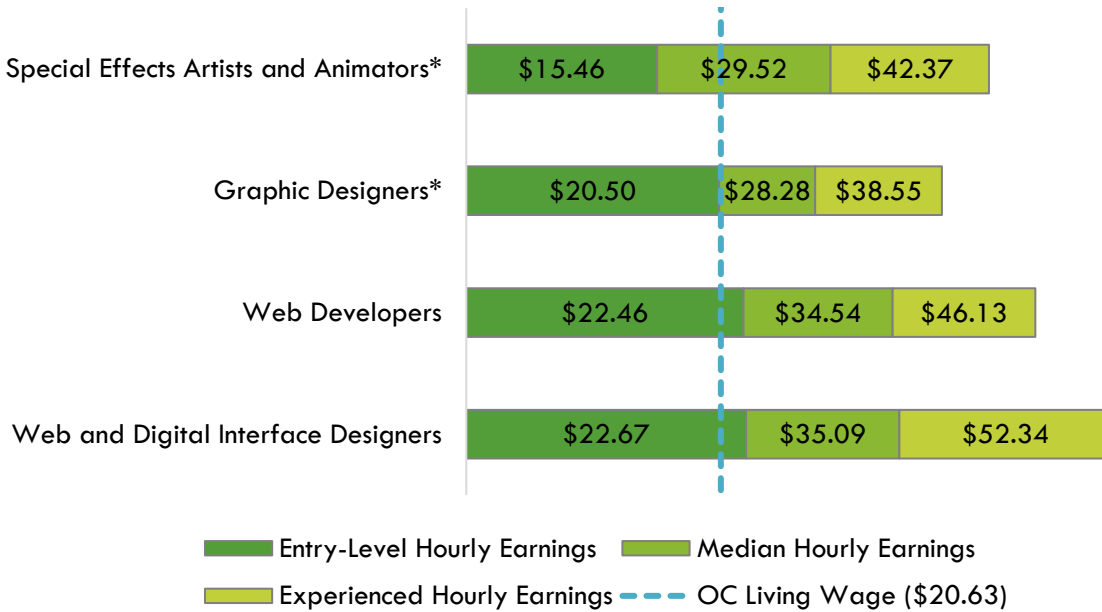
Wages:

The labor market endorsement in this report considers the entry-level hourly wages for these middle-skill multimedia occupations in Orange County as they relate to the county's living wage. Los Angeles County wages are included below in order to provide a complete analysis of the LA/OC region.

All annual openings for these middle-skill multimedia occupations have entry-level wages above the living wage for one adult (\$20.63 in Orange County). Typical entry-level hourly wages range between \$22.46 and \$22.67. Orange County's average wages are below the average statewide wage of \$44.13 for these occupations. Exhibit 5, on the following page, shows the wage range for each of these multimedia occupations in Orange County and how they compare to the regional living wage, sorted from lowest to highest entry-level wage. Notably, entry-level wages for the middle-skill occupations are higher than the above middle-skill occupations.

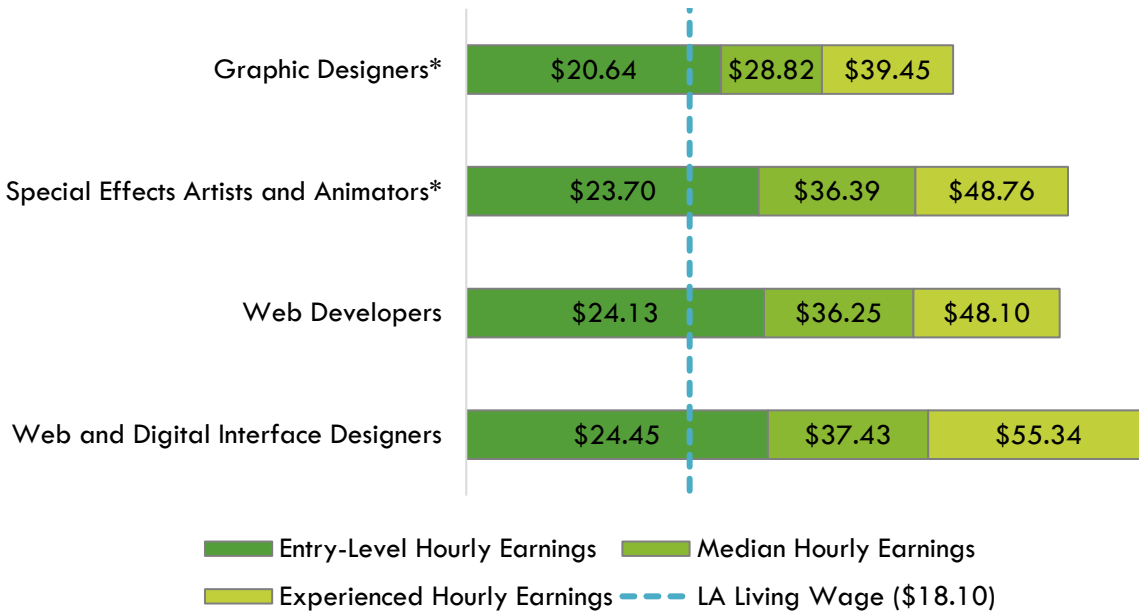
¹ Five-year change represents new job additions to the workforce. Annual openings include new jobs and replacement jobs that result from retirements and separations.

Exhibit 5: Wages by Occupation in Orange County



All annual openings for these middle-skill multimedia occupations have entry-level wages above the living wage for one adult (\$18.10 in Los Angeles County). Typical entry-level hourly wages are in a range between \$24.13 and \$24.45. Los Angeles County’s average wages are lower than the statewide wage of \$44.13 for these occupations. Exhibit 6 shows the wage range for each of these multimedia occupations in Los Angeles County and how they compare to the regional living wage, sorted from lowest to highest entry-level wage. Notably, entry-level wages for the middle-skill occupations are higher than the above middle-skill occupations.

Exhibit 6: Wages by Occupation in Los Angeles County



Job Postings:

There were 18,657 online job postings related to these multimedia occupations listed in the past 12 months. Of those, 66% (12,282) were for middle-skill multimedia occupations. Exhibit 7 shows the number of job postings by occupation.

Exhibit 7: Number of Job Postings by Occupation (n=18,657)

Occupation	Job Postings	Percentage of Job Postings
Web Developers	10,578	57%
Graphic Designers*	5,075	27%
Web and Digital Interface Designers	1,704	9%
Special Effects Artists and Animators*	1,300	7%
Total Postings	18,657	100%

The top employers for the middle-skill multimedia occupations in the region, by number of job postings, are shown in Exhibit 8.

Exhibit 8: Top Middle-Skill Employers by Number of Job Postings (n=12,282)

Employer	Job Postings	Percentage of Job Postings
Jobot	648	5%
CyberCoders	615	5%
Motion Recruitment	321	3%
Amazon	230	2%
Robert Half	227	2%
Randstad	124	1%
Canteen Vending	118	1%
Anthem Blue Cross	116	1%
Revature	112	1%
Deloitte	107	1%

The top employers for the above middle-skill multimedia occupations in the region, by number of job postings, are shown in Exhibit 9.

Exhibit 9: Top Above Middle-Skill Employers by Number of Job Postings (n=6,375)

Employer	Job Postings	Percentage of Job Postings
Robert Half	177	3%
Disney	106	2%
Onward Search	76	1%
Canteen Vending	58	1%
Creative Circle	45	1%
Electronic Arts	45	1%
NBC	43	1%
Amazon	39	1%
Aquent	36	1%
Randstad	36	1%

The top specialized, soft, and software/computer skills listed by those most frequently mentioned in job postings (denoted in parentheses) are shown for these middle-skill occupations in Exhibit 10.

Exhibit 10: Top Skills for Middle-Skill Occupations by Number of Job Postings (n=12,282)

Top Specialized Skills	Top Soft Skills	Top Software and Computer Skills
JavaScript (Programming Language) (4,506)	Communications (3,364)	JavaScript (Programming Language) (4,506)
User Experience (4,024)	Detail Oriented (2,682)	Cascading Style Sheets (CSS) (3,953)
Cascading Style Sheets (CSS) (3,953)	Microsoft Excel (2,324)	HyperText Markup Language (HTML) (2,950)
Front End (Software Engineering) (3,227)	Management (2,011)	React.js (2,904)
User Interface (3,126)	Customer Service (1,903)	Application Programming Interface (API) (2,137)
HyperText Markup Language (HTML) (2,950)	Microsoft Office (1,833)	Amazon Web Services (1,843)
React.js (2,904)	Organizational Skills (1,446)	Node.js (1,718)
Computer Science (2,719)	Operations (1,396)	Angular (Web Framework) (1,688)
Agile Methodology (2,524)	Written Communication (1,335)	HTML5 (1,447)
User Experience Design (UX) (2,144)	Filing (1,330)	Figma (Design Software) (1,410)

The top specialized, soft, and software/computer skills listed by those most frequently mentioned in job postings (denoted in parentheses) are shown for these above middle-skill occupations in Exhibit 11.

Exhibit 11: Top Skills for Above Middle-Skill Occupations by Number of Job Postings (n=6,375)

Top Specialized Skills	Top Soft Skills	Top Software and Computer Skills
Adobe Photoshop (3,326)	Communications (2,842)	Adobe Photoshop (3,326)
Adobe Illustrator (3,132)	Detail Oriented (2,064)	Adobe Illustrator (3,132)
Graphic Design (3,075)	Presentations (1,329)	Adobe InDesign (2,083)
Marketing (2,284)	Ability To Meet Deadlines (991)	Adobe Creative Suite (1,989)
Adobe InDesign (2,083)	Packaging And Labeling (985)	Adobe After Effects (1,043)
Adobe Creative Suite (1,989)	Time Management (919)	Microsoft PowerPoint (651)
Typography (1,455)	Multitasking (908)	Microsoft Office (606)

Top Specialized Skills	Top Soft Skills	Top Software and Computer Skills
Animations (1,184)	Sales (824)	HyperText Markup Language (HTML) (552)
Adobe After Effects (1,043)	Problem Solving (793)	Microsoft Excel (487)
Illustration (946)	Innovation (703)	Autodesk Maya (449)

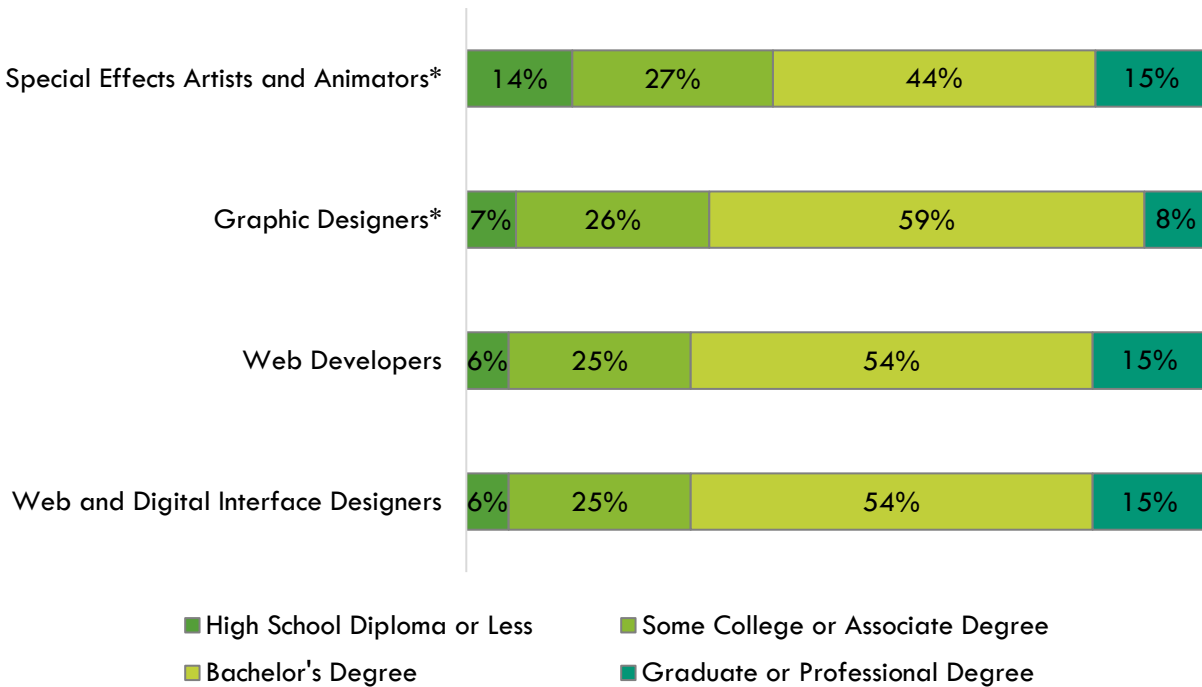
Educational Attainment:

The Bureau of Labor Statistics (BLS) lists a bachelor's degree as the typical entry-level education for all four multimedia occupations in this report. The national-level educational attainment data indicates approximately 25% of workers in the middle-skill occupations have completed some college or an associate degree as their highest level of education. Between 26% and 27% of workers in the above middle-skill occupations have completed some college or an associate degree. Exhibit 12 shows the educational attainment for each occupation, sorted by highest community college educational attainment to lowest.

Of the 46% of the cumulative job postings for these middle-skill multimedia occupations that listed a minimum education requirement in Los Angeles/Orange County, 88% (5,000) requested a bachelor's degree and 9% (515) requested a high school diploma or an associate degree.

Conversely, of the 50% of the postings for these above middle-skill multimedia occupations that listed a minimum education requirement, 80% (2,542) requested a bachelor's degree and 19% (592) requested a high school diploma or an associate degree.

Exhibit 12: National-level Educational Attainment for Occupations



Educational Supply

Community College Supply:

Exhibit 13 shows the three-year average number of awards conferred by community colleges in the related TOP codes: Digital Media (0614.00), Multimedia (0614.10), Website Design and Development (0614.30), Animation (0614.40), Computer Graphics and Digital Imagery (0614.60), World Wide Web Administration (0709.00), and Graphic Art and Design (1030.00). The colleges with the most completions in the region are: Santa Monica, Mt. San Antonio, Golden West. Over the past 12 months, there were no other related program recommendation requests from regional community colleges.

Exhibit 13: Regional Community College Awards (Certificates and Degrees), 2018-2021

TOP Code	Program	College	2018-2019 Awards	2019-2020 Awards	2020-2021 Awards	3-Year Award Average
0614.00	Digital Media	Glendale	0	1	0	0
		LA Mission	1	4	5	3
		LA Trade	19	11	18	16
		Pasadena	0	0	3	1
		Rio Hondo	0	2	1	1
		LA Subtotal	20	18	27	21
		Coastline	3	0	3	2
		Cypress	0	0	2	1
		Golden West	10	10	7	8
		Irvine	9	1	6	5
		Saddleback	0	0	1	0
		Santa Ana	0	1	6	2
		OC Subtotal	22	12	25	18
Supply Subtotal/Average			42	30	52	39
0614.10	Multimedia	East LA	0	2	0	1
		LA Mission	21	18	23	21
		Pasadena	6	1	0	2
		Santa Monica	5	5	9	6
		LA Subtotal	32	26	32	30
		Cypress	0	1	1	1
		Orange Coast	1	2	4	2
		Santiago Canyon	9	3	4	5
		OC Subtotal	10	6	9	8
Supply Subtotal/Average			42	32	41	38
0614.30	Website Design and Development	LA Pierce	3	2	4	3
		Mt San Antonio	9	7	6	7
		Pasadena	0	1	1	1

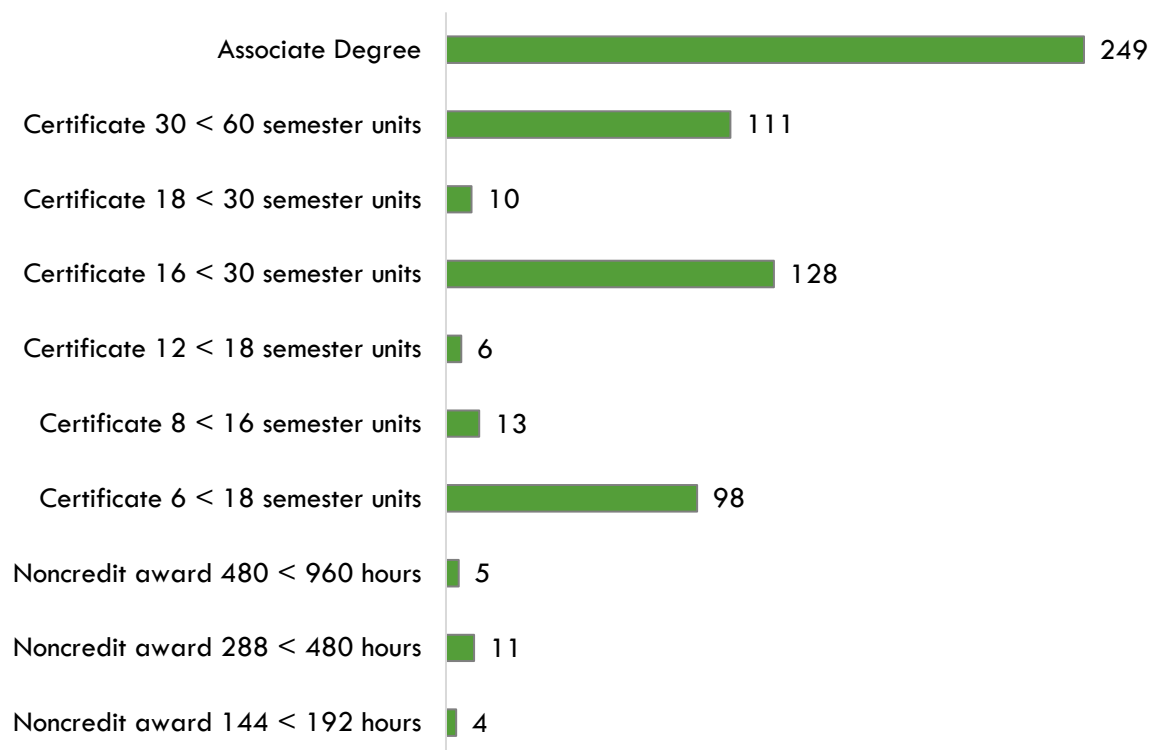
TOP Code	Program	College	2018-2019 Awards	2019-2020 Awards	2020-2021 Awards	3-Year Award Average
		Santa Monica	0	2	3	2
		LA Subtotal	12	12	14	13
		Coastline	1	1	1	1
		Fullerton	3	0	1	2
		Irvine	3	0	5	2
		Orange Coast	0	9	7	5
		Saddleback	7	2	7	5
		Santa Ana	0	2	1	1
		Santiago Canyon	24	3	6	11
		OC Subtotal	38	17	28	27
		Supply Subtotal/Average	50	29	42	40
0614.40	Animation	Cerritos	7	13	4	8
		East LA	14	12	12	13
		El Camino	5	5	4	5
		Glendale	2	6	2	3
		LA City	0	0	1	0
		LA Mission	8	11	5	8
		Mt San Antonio	67	58	43	56
		Pasadena	2	1	6	3
		Rio Hondo	11	9	9	10
		Santa Monica	9	19	69	32
		LA Subtotal	125	134	155	138
		Coastline	0	0	1	0
		Cypress	7	1	0	2
		Fullerton	0	1	0	0
		Irvine	1	1	3	2
		Orange Coast	0	1	0	0
		Santa Ana	15	0	0	5
		OC Subtotal	23	4	4	9
		Supply Subtotal/Average	148	138	159	147
0614.60	Computer Graphics and Digital Imagery	Citrus	13	12	26	17
		East LA	16	1	2	6
		Mt San Antonio	0	0	1	0
		LA Subtotal	29	13	29	23
		Coastline	5	1	0	2
		Cypress	7	5	0	4
		Fullerton	2	1	3	2

TOP Code	Program	College	2018-2019 Awards	2019-2020 Awards	2020-2021 Awards	3-Year Award Average
		North Orange Adult	9	3	0	4
		Orange Coast	38	21	31	30
		Saddleback	4	4	2	4
		Santa Ana	0	11	3	4
		OC Subtotal	65	46	39	50
		Supply Subtotal/Average	94	59	68	73
0709.00	World Wide Web Administration	Glendale	6	7	10	7
		LA Pierce	9	0	2	4
		Long Beach	22	24	34	27
		Santa Monica	0	0	16	5
		West LA	13	9	6	10
		LA Subtotal	50	40	68	53
		Fullerton	0	0	1	0
		Saddleback	0	2	2	2
		OC Subtotal	0	2	3	2
		Supply Subtotal/Average	50	42	71	55
1030.00	Graphic Art and Design	Cerritos	11	11	14	12
		East LA	18	3	8	10
		El Camino	0	1	0	0
		Glendale	6	4	9	6
		LA City	6	22	8	12
		LA Pierce	22	15	13	16
		LA Valley	2	5	1	2
		Long Beach	1	2	8	4
		Mt San Antonio	15	11	20	15
		Pasadena	9	7	15	11
		Rio Hondo	30	20	28	25
		Santa Monica	31	50	43	41
		LA Subtotal	151	151	167	154
		Cypress	0	0	4	1
		Fullerton	12	12	14	13
		Golden West	57	32	20	36
		Irvine	5	16	21	14
		Saddleback	23	15	19	19
		Santa Ana	4	3	3	3
		Santiago Canyon	5	1	4	3

TOP Code	Program	College	2018-2019 Awards	2019-2020 Awards	2020-2021 Awards	3-Year Award Average
		OC Subtotal	106	79	85	89
		Supply Subtotal/Average	50	42	71	55
		Supply Total/Average	683	560	685	635

Exhibit 14 shows the annual average community college awards by type from 2018-19 through 2020-21. The plurality of the awards are for associate degrees, followed by certificates between 16 and less than 30 semester units and certificates between 30 and less than 60 semester units.

Exhibit 14: Annual Average Community College Awards by Type, 2018-2021



Community College Student Outcomes:

Exhibit 15 shows the Strong Workforce Program (SWP) metrics for multimedia programs in Coast Community College District (Coast CCD), the Orange County Region, and California. Of the 574 multimedia students in Orange County, 25% (143) attended a Coast CCD college.

Additionally, Coast CCD students that exited multimedia programs in the 2018-19 academic year had median annual earnings of \$25,050 after exiting the program, which is lower when compared to the Orange County Region (\$34,088) and California (\$32,448). There was no median change in earnings for Coast CCD students that exited multimedia programs.

Exhibit 15: Multimedia (0509.00) Strong Workforce Program Metrics, 2019-20²

SWP Metric	Coast CCD	OC Region	California
SWP Students	143	574	5,041
SWP Students Who Earned 9 or More Career Education Units in the District in a Single Year	49%	14%	23%
SWP Students Who Completed a Noncredit CTE or Workforce Preparation Course	Insufficient Data	85%	52%
SWP Students Who Earned a Degree or Certificate or Attained Apprenticeship Journey Status	Insufficient Data	Insufficient Data	176
SWP Students Who Transferred to a Four-Year Postsecondary Institution (2018-19)	Insufficient Data	Insufficient Data	274
SWP Students with a Job Closely Related to Their Field of Study (2017-18)	Insufficient Data	40%	0%
Median Annual Earnings for SWP Exiting Students (2018-19)	\$25,050 (\$12.04)	\$34,088 (\$16.39)	\$32,448 (\$15.60)
Median Change in Earnings for SWP Exiting Students (2018-19)	0%	0%	39%
SWP Exiting Students Who Attained the Living Wage (2018-19)	Insufficient Data	31%	39%

Non-Community College Supply:

For a comprehensive regional supply analysis, it is also important to consider the supply from other institutions in the region that provide training programs for these multimedia occupations. Exhibit 16 shows the annual and three-year average number of awards conferred by these institutions in the related Classification of Instructional Programs (CIP) Codes: Digital Communication and Media/Multimedia (09.0702); Animation, Interactive Technology, Video Graphics, and Special Effects (10.0304); Computer Graphics (11.0803); Web/Multimedia Management and Webmaster (11.1004); Digital Arts (50.0102); Graphic Design (50.0409); and Game and Interactive Media Design (50.0411)

Due to different data collection periods, the most recent three-year period of available data is from 2017 to 2020. Between 2017 and 2020, eight colleges in the region conferred an average of 762 awards annually in related training programs.

Exhibit 16: Regional Non-Community College Awards, 2017-2020

CIP Code	Program	College	2017-2018 Awards	2018-2019 Awards	2019-2020 Awards	3-Year Award Average
09.0702	Digital Communication and Media/Multimedia	California State University-Dominguez Hills	41	58	41	47
		Fremont College	1	1	1	1
		Marymount California University	0	3	10	4
		Vanguard University of Southern California	7	8	2	6
Supply Subtotal/Average			49	70	54	58

² All SWP metrics are for 2019-20 unless otherwise noted.

CIP Code	Program	College	2017-2018 Awards	2018-2019 Awards	2019-2020 Awards	3-Year Award Average
10.0304	Animation, Interactive Technology, Video Graphics, and Special Effects	Art Center College of Design	9	18	36	21
		California Institute of the Arts	0	0	39	13
		Chapman University	0	0	20	7
		Gnomon	36	40	66	48
		Laguna College of Art and Design	11	37	33	27
		Los Angeles Film School	44	51	47	48
		Loyola Marymount University	20	15	21	19
		New York Film Academy	14	19	24	19
Supply Subtotal/Average			134	180	286	202
11.0803	Computer Graphics	ABC Adult School	5	4	4	4
		Los Angeles Pacific College	0	33	0	11
Supply Subtotal/Average			5	37	4	15
11.1004	Web/Multimedia Management and Webmaster	ABCO Technology	17	24	37	26
		Los Angeles Pacific College	0	0	1	0
		Pepperdine University	2	0	0	1
Supply Subtotal/Average			19	24	38	27
50.0102	Digital Arts	Los Angeles Academy of Figurative Art	0	3	4	2
		Los Angeles Pacific College	0	0	4	1
		Marymount California University	17	15	3	12
		Otis College of Art and Design	92	69	48	70
		University of Southern California	16	14	15	15
		Woodbury University	4	1	2	2
Supply Subtotal/Average			129	102	76	102
50.0409	Graphic Design	Art Center College of Design	50	73	67	63
		California Institute of the Arts	11	9	12	11
		California State Polytechnic University-Pomona	128	92	89	103
		Chapman University	19	17	27	21
		Concordia University-Irvine	9	7	10	9

CIP Code	Program	College	2017-2018 Awards	2018-2019 Awards	2019-2020 Awards	3-Year Award Average
		East San Gabriel Valley Regional Occupational Program	0	0	0	0
		FIDM-Fashion Institute of Design & Merchandising-Los Angeles	36	38	38	37
		Laguna College of Art and Design	21	24	25	24
		Los Angeles Film School	0	3	28	10
		Los Angeles Pacific College	0	1	8	3
		New York Film Academy	3	3	0	2
		Otis College of Art and Design	0	1	0	0
		Platt College-Los Angeles	3	0	0	1
		Supply Subtotal/Average	129	102	76	102
50.0411	Game and Interactive Media Design	Chapman University	0	1	0	0
		Laguna College of Art and Design	29	20	34	27
		Los Angeles Film School	27	9	0	12
		New York Film Academy	4	4	7	5
		University of California-Irvine	0	0	0	0
		University of Southern California	23	30	28	27
		Woodbury University	1	3	6	3
		Supply Subtotal/Average	84	67	75	74
		Supply Subtotal/Average	700	748	837	762

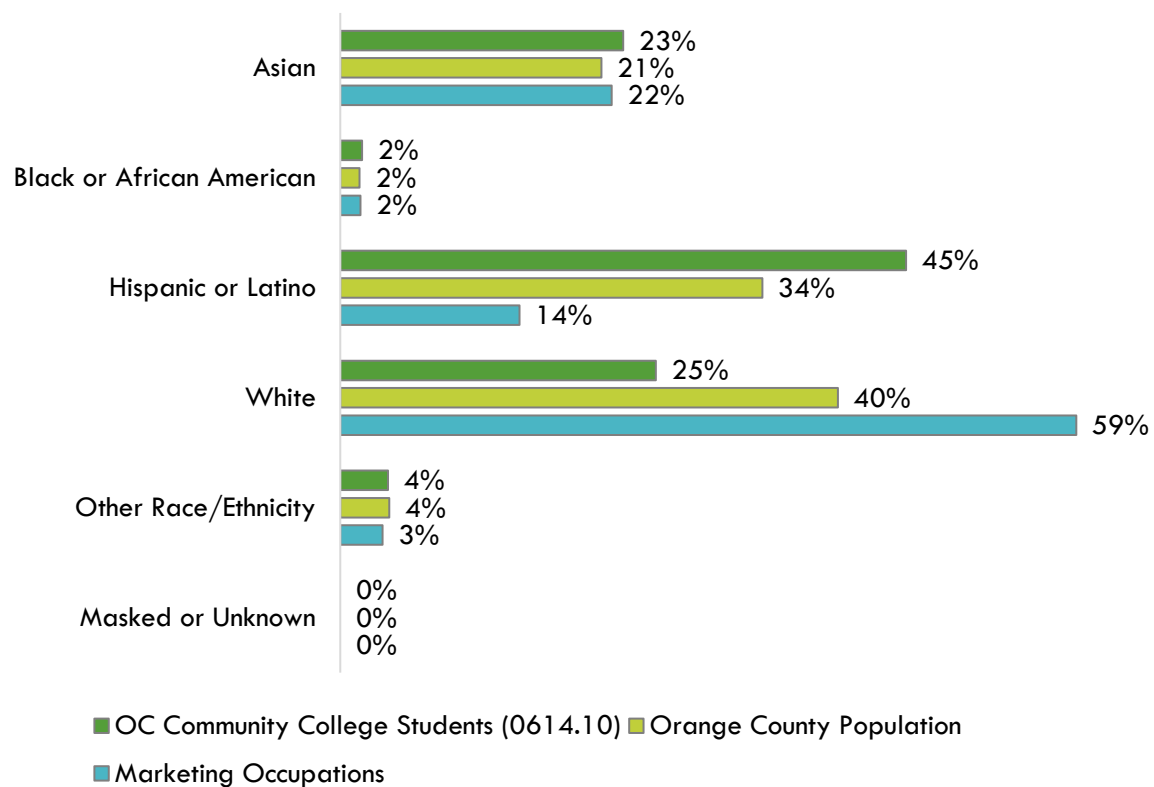
Regional Demographics

This section analyzes demographic data for Orange County community college students enrolled in multimedia programs compared to the OC population, as well occupational data, for the purpose of identifying potential diversity and equity issues that can be addressed by community college programs.

Ethnicity:

Exhibit 17 shows the ethnicity of Orange County community college students enrolled in multimedia programs compared to the overall Orange County population, as well as the six multimedia occupations included in this report. Notably, 59% of workers employed in these multimedia occupations are White, which is significantly higher than the population (40%) and community college multimedia students (25%). Conversely, 45% of community college multimedia students are Hispanic or Latino, which is higher than the Orange County population (34%) and significantly higher than workers in these multimedia occupations (14%).

Exhibit 17: Program and County Demographics by Ethnicity

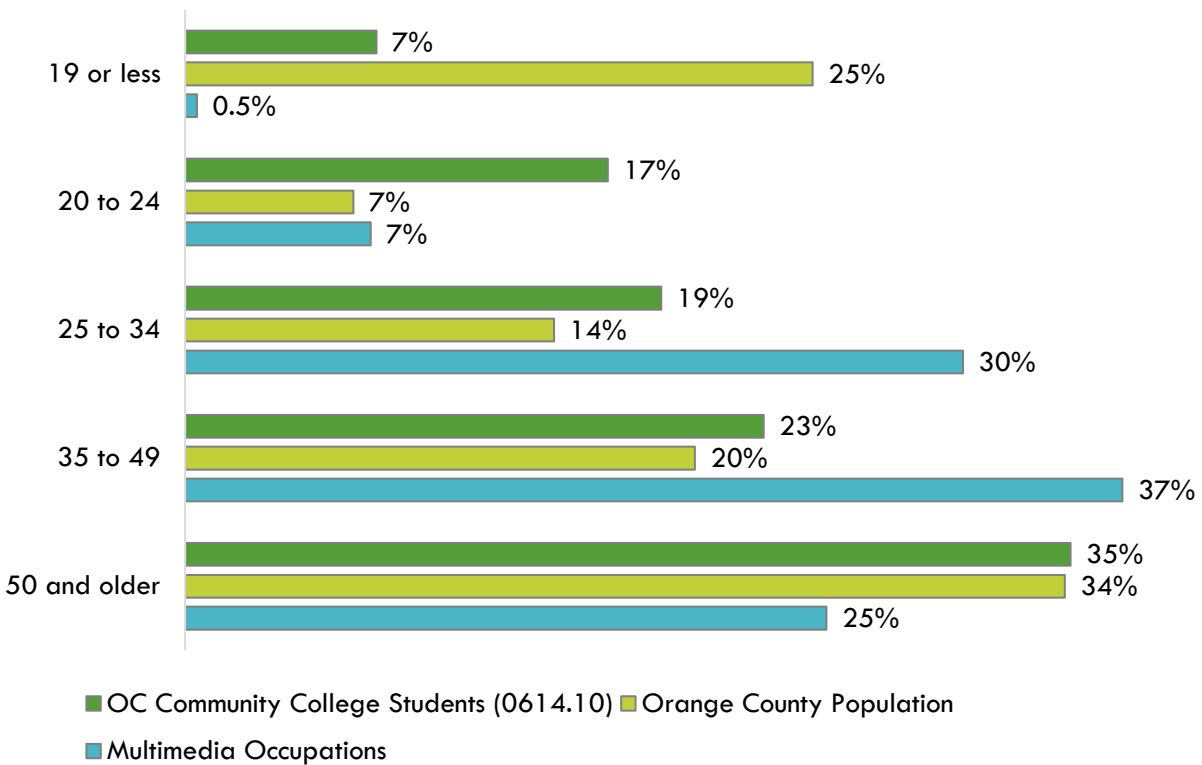


Age:

Exhibit 18 shows the age of Orange County community college students enrolled in multimedia programs compared to the overall Orange County population, as well as the six multimedia occupations included in this report. The plurality of workers in these multimedia occupations are age 35 to 49 (37%), which is significantly higher than the population (20%) and community college multimedia students (23%).

Examining disaggregated data for each occupation (not shown), the two middle-skill occupations have highest percentage of workers age 34 or less (48%).

Exhibit 18: Program and County Demographics by Age

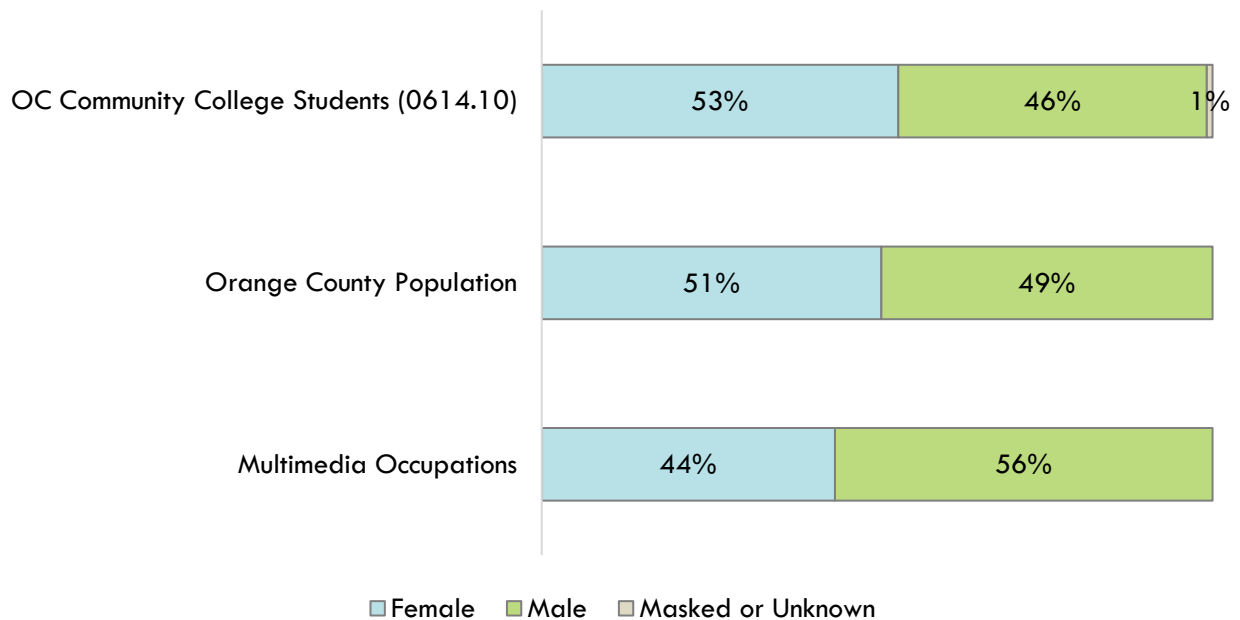


Sex:

Exhibit 19 shows the sex of Orange County community college students enrolled in multimedia programs compared to the overall Orange County population as well as these multimedia occupations.

Though the Orange County population is split nearly evenly between men and women, 56% of multimedia students and workers in these multimedia occupations are men. Examining disaggregated data for each occupation (not shown), *web developers* and *web and digital interface designers* have the highest percentage of men (74%) and also has the highest entry-level wages of all four multimedia occupations (\$22.46 and \$22.67, respectively).

Exhibit 19: Program and County Demographics by Sex



Appendix A: Methodology A

The OC COE prepared this report by analyzing data from occupations and education programs. Occupational data is derived from Lightcast, a labor market analytics firm that consolidates data from the California Employment Development Department (EDD), U.S. Bureau of Labor Statistics (BLS) and other government agencies. Program supply data is drawn from two systems: Taxonomy of Programs (TOP) and Classification of Instructional Programs (CIP).

Using a TOP-SOC crosswalk, the OC COE identified middle-skill jobs for which programs within these TOP codes train. Middle-skill jobs include:

- All occupations that require an educational requirement of some college, associate degree or apprenticeship;
- All occupations that require a bachelor's degree, but also have more than one-third of their existing labor force with an educational attainment of some college or associate degree; or
- All occupations that require a high school diploma or equivalent or no formal education, but also require short- to long-term on-the-job training where multiple community colleges have existing programs.

The OC COE determined labor market supply for an occupation or SOC code by analyzing the number of program completers or awards in a related TOP or CIP code. The COE developed a “supply table” with this information, which is the source of the program supply data for this report. TOP code data comes from the California Community Colleges Chancellor's Office MIS Data Mart (datamart.cccco.edu) and CIP code data comes from the Integrated Postsecondary Education Data System (nces.ed.gov/ipeds/use-the-data), also known as IPEDS. TOP is a system of numerical codes used at the state level to collect and report information on California community college programs and courses throughout the state that have similar outcomes. CIP codes are a taxonomy of academic disciplines at institutions of higher education in the United States and Canada. Institutions outside of the California Community College system do not use TOP codes in their reporting systems.

Data included in this analysis represent the labor market demand for relevant positions most closely related to the proposed program as expressed by the requesting college in consultation with the OC COE. Traditional labor market information was used to show current and projected employment based on data trends, as well as annual average awards granted by regional community colleges. Real-time labor market information captures job post advertisements for occupations relevant to the field of study which can signal demand and show what employers are looking for in potential employees, but is not a perfect measure of the quantity of open positions.

All representations have been produced from primary research and/or secondary review of publicly and/or privately available data and/or research reports. The most recent data available at the time of the analysis was examined; however, data sets are updated regularly and may not be consistent with previous reports. Efforts have been made to qualify and validate the accuracy of the data and findings; however, neither the Centers of Excellence for Labor Market Research (COE), COE host district, nor California Community Colleges Chancellor's Office are responsible for the applications or decisions made by individuals and/or organizations based on this study or its recommendations.

Appendix B: Data Sources

Data Type	Source
Occupational Projections, Wages, and Job Postings	<p>Traditional labor market information data is sourced from Lightcast, a labor market analytics firm. Lightcast occupational employment data are based on final Lightcast industry data and final Lightcast staffing patterns. Wage estimates are based on Occupational Employment Statistics and the American Community Survey. For more information, see https://lightcast.io/</p>
Living Wage	<p>The living wage is derived from the Insight Center’s California Family Needs Calculator, which measures the income necessary for an individual of family to afford basic expenses. The data assesses the cost of housing, food, child care, health care, transportation, and taxes. For more information, see: https://insightccd.org/family-needs-calculator/</p> <p>The living wage for one adult in Orange County is \$20.63 per hour (\$42,910.40 annually). This figure is used by the CCCCCO to calculate the percentage of students that attained the regional living wage.</p>
Typical Education and Training Requirements, and Educational Attainment	<p>The Bureau of Labor Statistics (BLS) provides information about education and training requirements for hundreds of occupations. BLS uses a system to assign categories for entry-level education, work experience in a related occupation, and typical on-the-job training to each occupation for which BLS publishes projections data. For more information, see https://www.bls.gov/emp/documentation/education/tech.htm</p>
Emerging Occupation Descriptions, Additional Education Requirements, and Employer Preferences	<p>The O*NET database includes information on skills, abilities, knowledges, work activities, and interests associated with occupations. For more information, see https://www.onetonline.org/help/online/</p>
Educational Supply	<p>The CCCCCO Data Mart provides information about students, courses, student services, outcomes and faculty and staff. For more information, see: https://datamart.cccco.edu</p> <p>The National Center for Education Statistics (NCES) Integrated Postsecondary Integrated Data System (IPEDS) collects data on the number of postsecondary awards earned (completions). For more information, see https://nces.ed.gov/ipeds/use-the-data/survey-components/7/completions</p>
Student Metrics and Demographics	<p>LaunchBoard, a statewide data system supported by the California Community Colleges Chancellor's Office and hosted by Cal-PASS Plus, provides data on progress, success, employment, and earnings outcomes for California community college students. For more information, see: https://www.calpassplus.org/LaunchBoard/Home.aspx</p>

Data Type	Source
Population and Occupation Demographics	<p>The Census Bureau's American Community Survey (ACS) is the premier source for detailed population and housing information. For more information, see: https://www.census.gov/programs-surveys/acs</p> <p>Data is sourced from IPUMS USA, a database providing access to ACS and other Census Bureau data products. For more information, see: https://usa.ipums.org/usa/about.shtml</p>

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