HIGHER EDUCATION
VIDEO GAME ALLIANCE

Priming the Pump 2015:

Higher Education Video Game Alliance Survey of Program Graduates

From The Executive Committee

In our last report, we showed how videogame-based programs in higher education not only offer a markedly multidisciplinary education but also draw – and retain – a more diverse student body than other STEM-related fields. We did now know, however, whether our graduates were successful on the job market, how they valued their education post-graduation, or even where they ended up. This second survey report answers those very questions.

As a follow up to our survey of institutions released in March 2015 – Higher Education Video Game Alliance Survey 2014-15: Our State of Play – we now release our first survey of video game-based program alumni, entitled Priming the Pump 2015: Higher Education Video Game Alliance Survey of Program Graduates. This "first-of-its-kind" survey reveals the value that our programs deliver not only in terms of employment and salary but also, and perhaps more crucially, in terms of workplace well-being, satisfaction, and happiness.

In this report, we give the first glimpse into what our alumni got out of their respective programs and how they are putting their education to work post-graduation. Such an understanding will help each of us in our collective efforts to prepare the next generation of video game designers, developers, leaders, researchers, and business experts.

We hope that you find it as illuminating as we have.

Sincerely,

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About the Alliance

Our mission is to create a platform for higher education leaders which will underscore the cultural, scientific, and economic importance of video game programs in colleges and universities. The key is to create a robust network of resources — including unified advocacy, policymaker engagement, media coverage, and external funding — in order to incubate and harness the impact of this community in a 21st century learning environment.

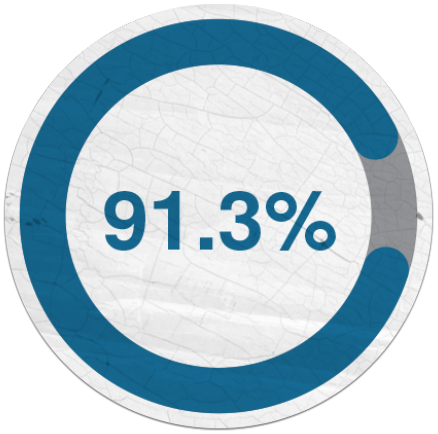
To learn more about the Higher Education Video Game Alliance, or to become a member, please visit www.higheredgames.org.

The Higher Education Video Game Alliance (The Alliance) surveyed graduates of college and university video game programs in two phases in early 2015. The second of two surveys working to capture the landscape in higher education video game programs, this alumni survey is also the first of its kind conducted on a nationwide and international scale.

Whereas our first survey, Higher Education Video Game Alliance Survey 2014-15: Our State of Play, featured results from 73 colleges and universities with video game certification or degree-granting programs, this survey reveals characteristics of alumni who graduated from those very kinds of programs. While Our State of Play spoke to our programs' greater gender diversity and higher levels of retention compared to other STEM-related disciplines, this survey speaks to the overall success of those programs in terms of alumni employment, salary, and happiness.

High Employment Rates Among Alumni

Alumni of game-based programs fare well on the overall market. The percentage of alumni reporting gainful employment after a single year on the market was 93.1%, more than 8% higher than national employment rates for college graduates four years post graduation. More than half of alumni surveyed work within the video game industry (55.8%).



Employment after a single year on the market

Contributions Beyond the Video Game Workforce

Game-based programs prepare students for more than just the games industry, however. While 55.8% of respondents work within the video game industry, the other 44.2% contribute to other vital industries, including education (26.8%), software development (5.8%), and government/security/defense (2.2%). Thus, a solid education in game design prepares students for more than just the games industry itself.

55.8% Video game industry

26.8% Education

5.8% Software development

2.2% Government / Security / Defense

Well-Paying Jobs

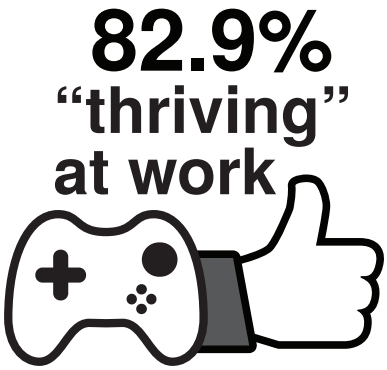
Alumni of game-based programs also earn higher salaries. Graduates who participated in this survey earn an estimated average salary of $76,200 annually for full-time positions, or $24,000 more than the U.S. national average for college graduates with full-time jobs. Findings show little difference between the average salary for those working within the video game industry and those working outside of it, although graduate degree holders do significantly out-earn alumni with only undergraduate degrees.

$76,200

Average salary for full-time positions

$24,000

More than the U.S. national average for college graduates with full-time jobs.



based on the Cantril scale

Higher Job Satisfaction

Finally, game-based program alumni report overall high rates of workplace well-being on the Cantril scale, with 82.9% classified as “thriving” out in the workplace. Additional items measuring autonomy, connectedness, sense of purpose, and satisfaction in career path and current employment context confirm these findings. Alumni working full-time reported even greater satisfaction than those working only part-time, and alumni working within the video game industry reported greater well-being than those working in other industries.

Role of Higher Ed Programs in Success

As the Our State of Play survey showed, game-based programs in higher education teach a broad diversity of courses that range from courses in specific programing languages to character design, from narrative development to animation, from user interface to the history and culture of games. Game Design, Project Courses, Game Programming and Critical Game Studies were reported as the most frequently offered, required, and completed courses based on this alumni report. Across all respondents, 91.3% rated their overall coursework as relevant with 67.5% rating their overall coursework in the top two categories. Alumni viewed their game related coursework as more relevant to their subsequent work than their non-game coursework although only one course, Game Design, reached an individual level of significance.

Survey Methodology

The Higher Education Video Game Alliance developed this survey in order to assess the educational coursework, employment status and attitudes, perceived relationship between the two of alumni of game-related programs in higher education. The survey was delivered in two phases: Phase one was delivered in January and February of 2015 and 89[1] total responses were collected by contacting institutions who had responded to the Alliance’s survey of educational institutions. Phase two was delivered in May of 2015 and an additional 88 responses were collected by contacting all institutions offering video game degree programs. Table 1 reports the number of responses collected during each phase of the survey and by method of contact.

Table 1. Number of valid responses by phase and method of contact.

Source	Number of Responses
Phase 1 – survey forwarded to member institutions	85
Phase 2 – survey forwarded to member institutions	68
Phase 2 – survey forwarded to non-member institutions	16
Phase 2 – web link publicized in Entertainment Software Association newsletter	8

Sixteen responses were removed as duplicates or insufficient responses. The combined data corpus is largely comprised of respondents from institutions associated with the Alliance, which should be considered before generalizing these results to all video game programs.

[1] Phase 1 survey had 89 responses but in four cases the same individual responded to phase 2 and that data was deemed more complete, in one instance the first phase data was more complete and was retained.

Full Survey Results

Demographics

A total of 177 video game-based program alumni participated in this survey. The average age of respondents was 29.5 years (SD = 7.2, range 19-62). Thirty-nine (22.0 %) were female, 130 (73.4%) were male, and 8 did not report gender. Compared to the overall gender profile of game program enrollees reported in Our State of Play earlier this year (30% of undergraduate students and 33% of graduate students), the current sample may include a disproportionate number of female respondents. Future surveys should address this sampling error.

Table 2 shows the race and ethnicity of respondents. Seventeen participants (9.6%) selected more than one category. Of the 91.5% of respondents who reported race and ethnicity, 74% selected White as at least one of their ethnic backgrounds, with Asian (10.2%), Hispanic or Latino (7.3%), and Asian Indian (5.1%) the next three most frequently reported. Compared to the overall U.S. population (US Census Bureau, 2013), our sample contains a disproportionately high number of Asians (10.2% versus 5.3% respectively) and low number of African Americans (1.7% versus 13.3% respectively) and Hispanic or Latinos (7.3% versus 17.1% respectively). While the current majority of members are within the U.S., HEVGA is an international organization; thus, such comparisons should be interpreted cautiously.

Table 2. Overall race and ethnicity of survey participants

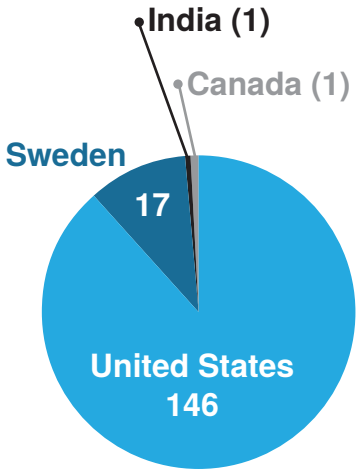
Category	Number	Percentage
American Indian; Alaska Native	5	2.8%
Asian	18	10.2%
Asian Indian	9	5.1%
Black or African American	3	1.7%
Hispanic or Latino	13	7.3%
Middle Eastern	2	1.1%
Native Hawaiian or Other Pacific Islander	1	0.6%
White	131	74.0
Other[2]	3	1.7%
Not reported/I prefer not to answer	15	8.5%

[2] Other reported race and ethnicities include European, Kazakh, and Fennoscandian

Educational Background

Of the 177 game program alumni who responded, 165 (93.2%) completed their degree with 149 (84.2%) receiving a degree explicitly within game design or another game-related program. One participant reported no earned degree. The remaining 11 participants (6.2%) did not report any information on the status of their degree. Data reported in this remainder of this section reflect responses from the 165 participants who earned their degree except when no data was given on specific individual items.

The majority of degrees were earned in the United States (146). The remaining international degrees were earned in Sweden (17), Canada (1) and India (1). Within the US, degrees were reported from 12 states (CA, MA, MI, NY, PA, RI, TN, TX, UT VA, WA and WI). Just over half (55.4%; n=83) of the 165 participants who earned degrees received them from private institutions, with the remaining 66 participants (44.6%) receiving their degree from public institutions. Forty-three (24.3%) respondents earned more than one degree. A follow-up survey was used to explore previous degrees in more detail. Of the 30 who completed the second, follow-up survey, only 6 (20%) reported that their first degree was video game related. Thirty-five (19.8%) did not respond.



The average respondent graduated less than four years ago. Figure 1 shows the frequency distribution of respondents by year of graduation. More than three-fourths (83%) of the participants reported graduating in 2010 or later. While game related programs are indeed relatively new, the skewed distribution suggests an over-representation of recent graduates in the sample. This over-representation is likely due to the manner in which we collected the sample: Game based programs, who we used as the distributors for the survey, are commonly in more frequent contact with recent graduates than with earlier ones.

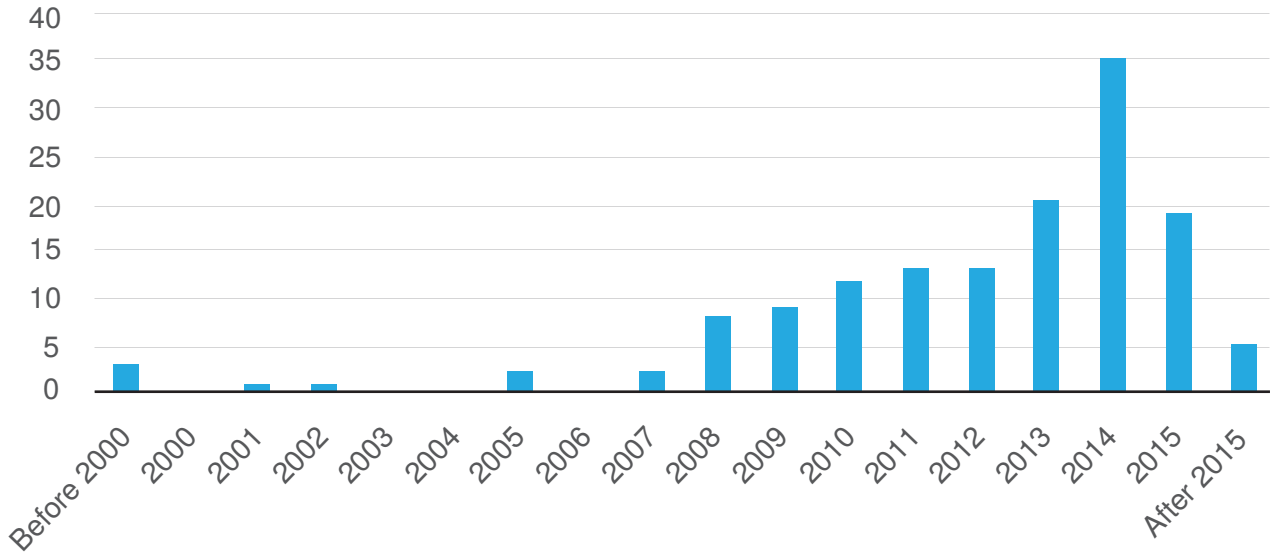


Figure 1. Number of survey respondents by graduation year

Table 3 details the types of degrees earned by respondents (n=149) whose diplomas were within a game-related program of some form (and not another college program that happened to contain game-related coursework or research). For participants reporting more than one degree, only the most recent degree is reflected.

Table 3. Types of degrees conferred

Category	Number
Associate of Arts	1
Bachelor of Arts	20
Bachelor of Science	16
Bachelor of Computer Science (BSc/BS)	15
Bachelor of Engineering	0
Master of Arts	3
Master of Entertainment Technology	14
Master of Fine Arts	21
Master of Science	16
Master of Computer Science (MSc)	9
Master of Engineering	0
Doctorate (PhD)	12
Other[3]	5
Did not respond	1

Of the 133 respondents who shared information on coursework, 67 reported on undergraduate degrees and 82 reported on graduate degrees. In the remainder of this report, comparisons between degree programs will focus on undergraduate versus graduate programs only.

Educational Coursework

Respondents were given a list of courses and asked to indicate which courses they completed as part of their game related degree. In phase two of the survey, based on responses to phase one, we included three additional course categories: Business of Gaming, Internship/Co-op and Virtual Worlds. A total of 149 participants completed this portion of the survey. The average number of courses taken by a participating alumni was 8.3.

[3] Other reported degree types conferred include Bachelor of Game Design, Bachelor of Fine Arts or Master of Entertainment Arts and Engineering.

Table 4 reports the coursework reported by participants and their frequency. Findings here corroborate earlier descriptions of coursework in game-related programs described in Our State of Play report released earlier this year: Game Design, Project Courses, Game Programming and Critical Game Studies are the most frequently offered, required, and completed courses according to both surveys. Interactive Storytelling is, however, one exception: Our previous survey showed that the course was offered by roughly 70% of the game programs but required by only 24% whereas here, nearly half of the alumni participating in the survey report having enrolled in the course.

Overall, courses show a generally higher frequency among undergraduate programs rather than graduate programs, reflecting the comparatively higher number of courses required for undergraduate work and the fact that undergraduate course sequences are, as a rule, more commonly standardized than in graduate programs. Undergraduate degree holders complete an average of 9.2 courses from the list while the graduate degree holders complete an average of 6.7 courses.

Table 4. Game-based program courses completed by alumni and the percentage of participants reporting

Course	Overall Average	Undergrad Only	Graduate Only
Game design	81.9%	92.5%	73.2%
Project courses	67.6%	74.2%	62.2%
Game programming	54.7%	74.2%	39.0%
Game production	49.3%	71.2%	31.7%
Interactive storytelling	46.3%	52.2%	41.5%
3D modeling	45.6%	71.6%	24.4%
Graphics	45.3%	52.2%	39.0%
Serious games	40.9%	46.3%	36.6%
Animation	38.9%	61.2%	20.7%
Level design	38.9%	59.7%	21.9%
Critical game studies	37.6%	40.3%	35.4%
Games and learning	37.2%	34.8%	39.0%
Game research	35.1%	34.8%	35.3%
Games and society	34.5%	37.9%	31.7%
Business of gaming	34.2%	44.8%	25.6%
Game engine scripting	33.1%	42.4%	25.6%
Visual design	29.5%	43.3%	18.3%
Game AI	23.0%	30.3%	17.1%
Game platform hardware architecture	17.6%	19.7%	15.8%
Internship or Co-op	16.1%	20.9%	12.2%
Virtual worlds	14.2%	07.6%	19.5%
Audio design	13.4%	20.9%	07.3%
Music courses	06.7%	10.4%	03.6%

Employment

More than three-quarters (78%, n=138) of participating alumni reported being employed at the time of the survey. After factoring out respondents who had not yet actually graduated from their current programs (i.e. those set to graduate in spring of 2015, when these data were collected), the percentage of alumni reporting gainful employment was 84.6% (n=104). Employment rattes alumni with at least a year post-graduation (i.e. those graduating in 2013 or earlier) was 93.1% (n=81). Compared to national figures, such numbers are promising: Although not a perfect apples to apples comparison, according to a survey conducted by the National Center for Educational Statistics, of 17,000 college graduates surveyed, only 85% were employed four years after graduating (Cataldi, E.F., Siegel, P., Shepherd, B., & Cooney, J. (2014).

Of those alumni who are employed, 78% (n=108) work full-time, 16% (n=22) work part-time, and 6% (n=8) are self-employed. Full-time employment is higher among alumni holding a degree explicitly in game design or another game-related program (61.4% compared to 43.7%), but the number of non-game degree holders is very small. Table 5 gives a breakdown of alumni employment by industry. Findings show that the majority of employed alumni work within the video game industry (55.8%); the second largest sector for employment is education (26.8%).

Table 5. Alumni employment by industry, in rank order by frequency

Industry	Number	Percentage
Video game – all	77	55.8%
Video game developer (large)	26	18.8%
Video game developer (small)	16	11.6%
Video game (serious/educational)	14	10.7%
Video game publisher (large)	9	06.5%
Video game (indie/art/experimental)	8	05.8%
Video game (other)	3	02.2%
Video game publisher (small)	1	00.7%
Education	37	26.8%
Software development	8	05.8%
Government, security or defense	3	02.2%
Technology hardware	3	02.2%
Web developer	2	01.4%
Research	2	01.4%
Retail	2	01.4%
Other[4]	4	02.8%

[4] Other reported industries of alumni employment include advertising, customer service, technical support and training.

Undergraduate degree holders averaged **$50,200** annually compared to **$75,400** for those with a graduate degree

$76,200

Average salary of full-time employees

respondents per year

The estimated average salary of all respondents reporting earnings is approximately $62,600 annually, with full-time employees averaging $76,200 per year and part-time employees averaging $29,000. Compare these figures to national averages: Among the 85% of college graduates in the U.S. who work full time, the average annualized salary from that primary job was $52,200 (Cataldi, E.F., Siegel, P., Shepherd, B., & Cooney, J. (2014). Findings show little difference between the average salary for those working within the video game industry and those working outside of it. Undergraduate degree holders averaged $50,200 annually compared to $75,400 for those with a graduate degree. A closer look at salary is found in Figure 2, which shows the number of full- and part-time employed alumni in each earning category. Part-time employees constitute all respondents earning less than $20,000.

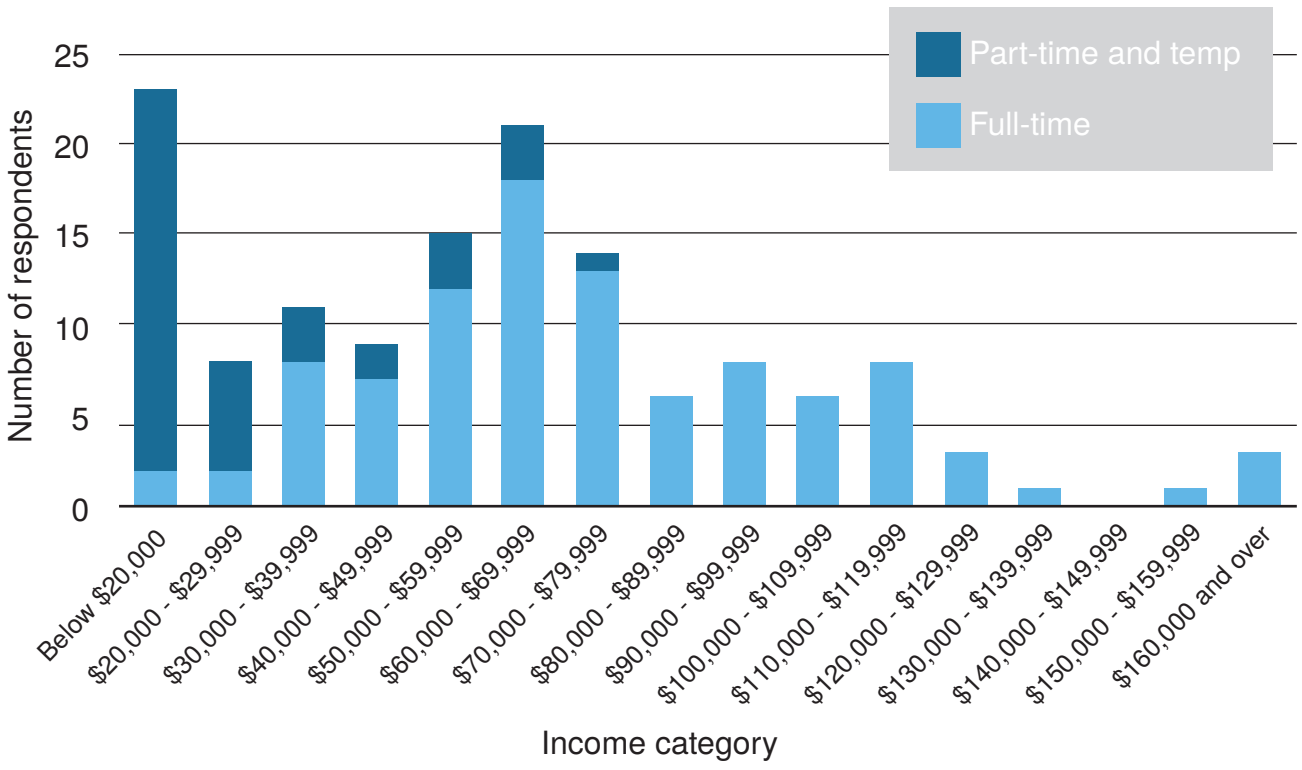
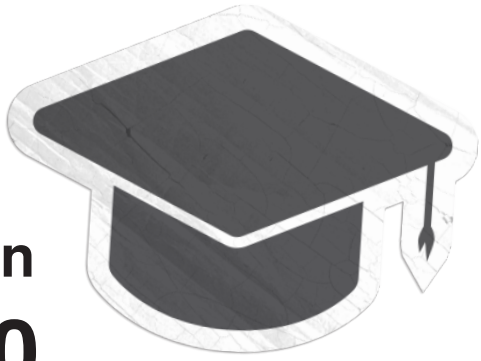


Figure 2. Number of employed alumni by salary range.

71%

of the respondents that earn more than $90,000 hold a graduate degree



Within the category of full-time employed alumni, we also compared graduates holding an undergraduate degree to graduates holding advanced degrees. Figure 3 shows the number of full-time employed alumni in each earning category by degree held. Although a handful of undergraduate degree holders earn above $90,000, the salary advantage of an advanced degree is apparent. Graduate degree holders make up just under half (48.5%) of the respondents, but they comprise 71% of all those earning above $90,000

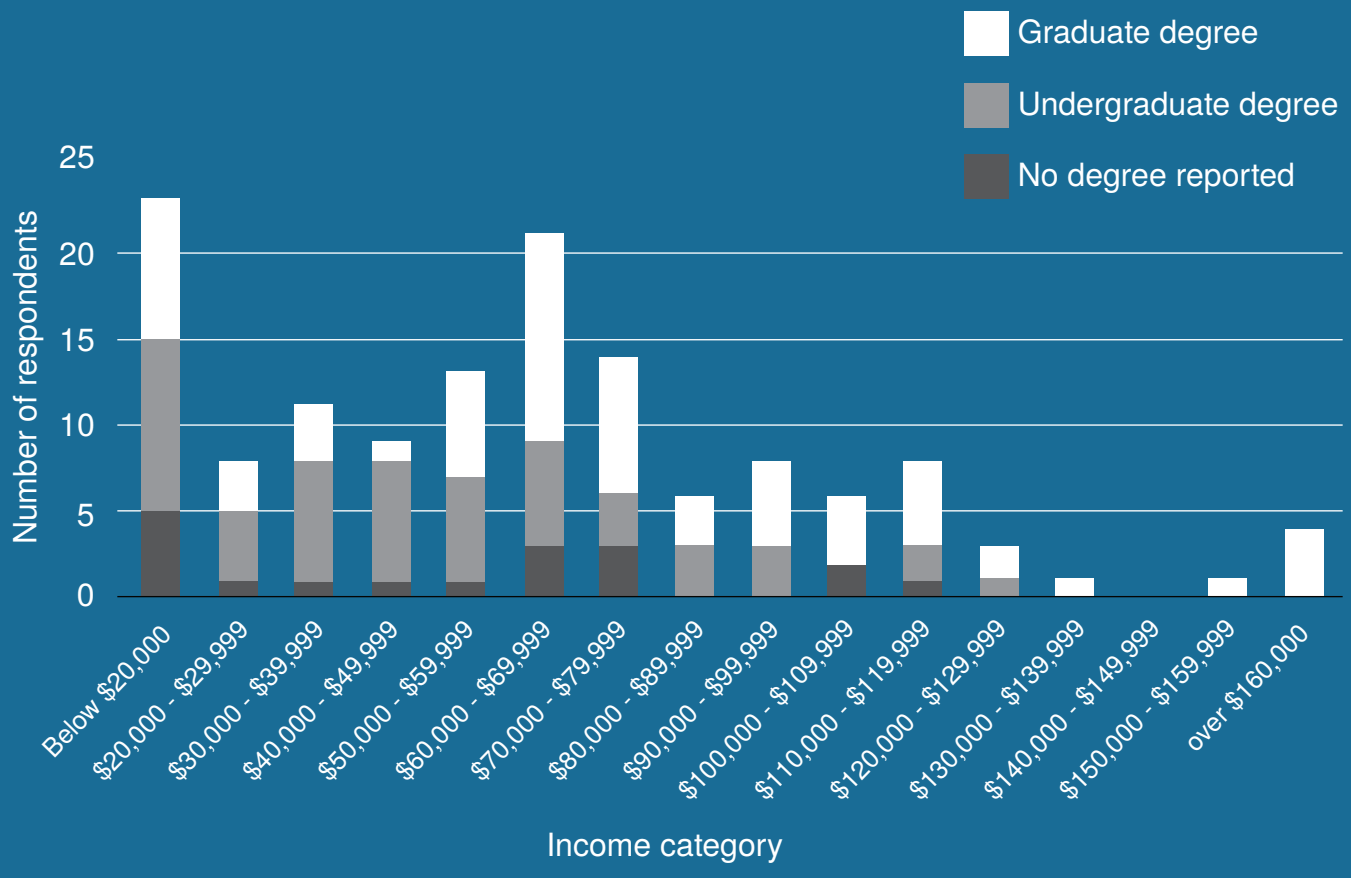


Figure 3. Number of employed alumni by degree salary range.

Educational Relevance in Employment

Our survey also investigated the connection between the educational experiences of the participants and their current employment. Alumni were also asked to rate the relevance of their game-related and non-game-related coursework on a five point scale from “not at all relevant” (1), to “very relevant” (5). Across all respondents, 91.3% rated their overall coursework as relevant with 67.5% rating their overall coursework in the top two categories. Video game related coursework had a mean rating of 3.83 (sd=1.18) and non-game related coursework has a mean rating of 3.48 (sd=1.13). This difference in relevance ratings, while relatively small, was statistically significant, $t(126)=3.11$, $p<.01$. Participants did view their game related coursework as more relevant than their non-game coursework (see Figure 4).

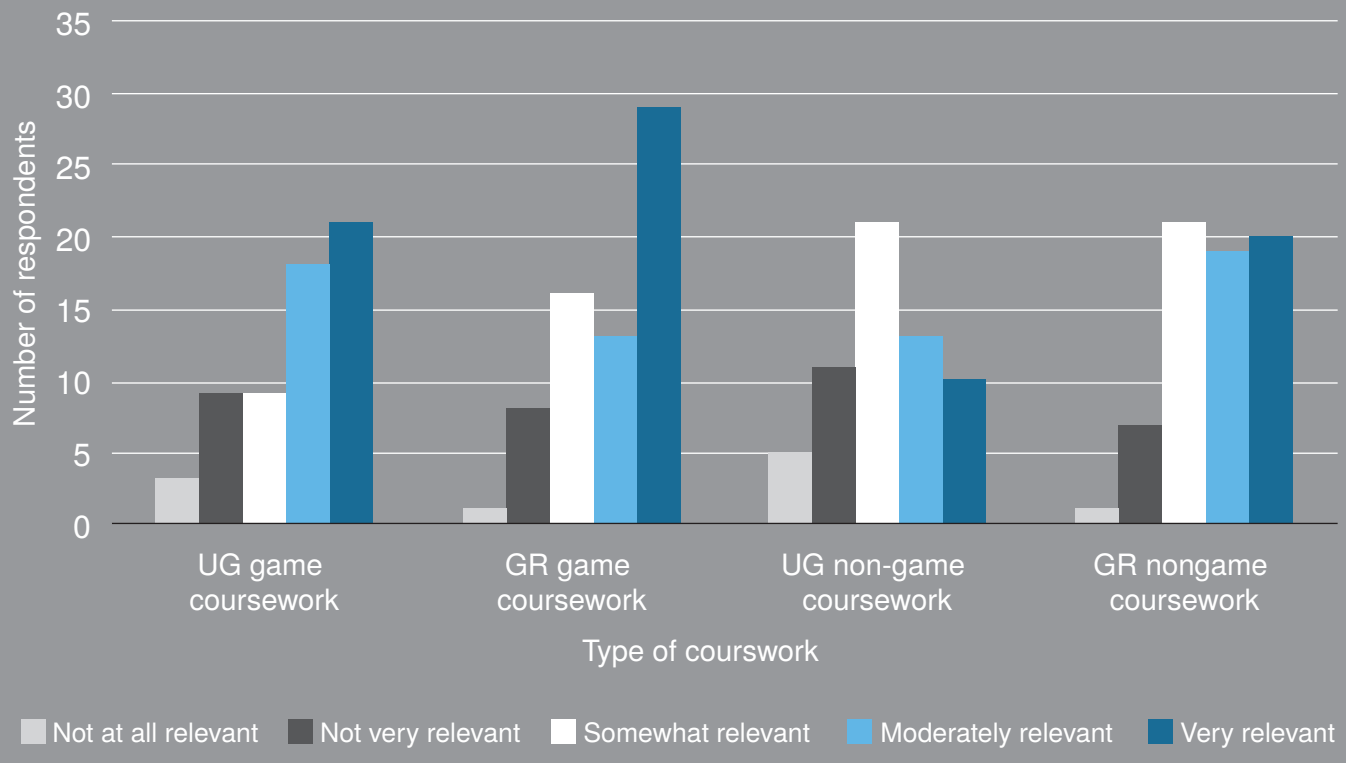


Figure 4. Frequency of response options for video game related and non-game related coursework for undergraduate (UG) courses and graduate (GR) courses.

To understand the relationship between specific coursework and evaluations of curriculum relevance, a regression analysis was performed using game curriculum relevance as the outcome variable and courses taken as predictor variables (see Appendix). Only one course, Game Design, reached an individual level of significance. Considering all coursework, the model is able to explain 13% of the variance in coursework relevance, while not a large amount of the variability it is statistically significant. Note, however, that the relationship here is between specific coursework and perceived relevance and not actual relevance. When we performed a second regression analysis using income as the outcome variable, for example, we obtained a different significant model with a completely different course list (see the Appendix).

Workplace Well-Being

Salary and benefits are only part of the equation in understanding the factors of importance to alumni and program success. Workplace well-being is another vital component. Using the Cantril scale method (Cantril, 1965), we evaluated alumni's satisfaction in their current jobs. We asked each participant to imagine the worse possible job as 0 and the best possible job as 10 and then rate their current position in relation to those two poles. This method, widely by the Gallup organization to gather data on overall wellbeing in a variety of settings, results in a self-anchoring scale that accounts for differences in individual expectations and external factors. Ratings on this ten-point scale are referred to as the employee's "overall workplace wellbeing"; ratings from 0-3 represent someone who is suffering, ratings from 4-6 represent someone who is struggling, and ratings of 7-10 represent someone who is thriving.

The average reported overall workplace well-being for employed alumni who participated in this survey was 7.57 (SD = 1.64) with 82.9% of employed alumni classified as "thriving" in their employment environment. Ratings did not differ significantly between those with undergraduate or graduates degrees but did differ significantly between alumni working full-time (7.77) and alumni only working part-time (7.05) ($F(1,121)=4.92$, $p<.05$) and between those working in the video game industry (7.94) and those working in other industries (7.06) ($F(1,121)=9.36$, $p<.01$). Ratings were modestly correlated with salary ($r=0.33$, $p=0.01$).

Our survey also included five additional 7-point Likert-style questions that were designed to measure employee motivation and happiness. Table 6 shows the mean response of alumni to each item (higher is better), the percentage of respondents who agreed or strongly agreed with each item, and the correlation between each item, salary mid-point[5], and workplace well-being measure. Across all five items, alumni reported high motivation and happiness in terms of both mean rating and percentage of respondents falling into the highest two categoriest of agreement. Multiple items significantly correlate with workplace well-being reports determined by the Cantril scale method as expected. However, there is almost no connection between workplace happiness and salary.

Table 6. Mean response to items measuring alumni motivation and happiness in the workplace and correlations with salary and workplace well-being

Statement	Mean Rating	% Respondents who Agree or Strongly Agree	Correlation with salary	Correlation with workplace wellbeing
I am interested and invested in the success of my co-workers and employer.	4.97	77.7%	0.04	0.47*
I feel a sense of purpose in the work that I do.	4.85	73.8%	0.08	0.41*
I have a good amount of autonomy in my work.	4.78	70.0%	-0.02	0.26
If I could start over I would pursue the same career I am in now.	4.74	66.1%	0.10	0.46*
I am satisfied with my current employment.	4.31	60.5%	0.17	0.60*

[5] Salary was reported using the Bureau of Labor Statistics categories. To convert this to a single value for use in correlation analysis, the mid-point for each range was entered. For those reporting below $20000 a value of $10,000 was used and for those reporting over $160,000 a value of $175,000 was used.

Next, we compared ratings of employee motivation and happiness of alumni working in the video game industry to those working outside the industry. Results are shown in Table 7. In three of the five areas rated, there were significant differences between alumni working in the video game industry and those working in other industries. Those working in the video game industry reported significantly higher levels of engagement with their employer and co-workers, $F(1,128)=7.16$, $p<.01$. This same group also reports higher levels of interest in pursuing the same career again if given the opportunity, $F(1,28)=26.94$, $p<.001$) and significantly higher levels of job satisfaction, $F(1,127)=6.27$, $p<.05$. This is not surprising given the fact that all of the indicators related to job satisfaction favor those working in the video game industry, including the two questions that were not significantly different. One explanation may be that alumni of video game related programs expect to work in the video game industry and report lower levels of engagement, satisfaction and likelihood to repeat their career when their professional paths take them in a different direction.

Overall, graduates of video game programs report believe that their game related curriculum is relevant in the work they do, report very high levels of workplace wellbeing, feel a sense of autonomy and purpose in their work, feel a sense of connection to their co-workers and employer and because of these report high levels of job satisfaction.

Table 7. Comparison of reported motivation and happiness between alumni working in the video game industry and those working outside it.

Statement	Mean Rating	Video Game industry	Other industry
I am interested and invested in the success of my co-workers and employer.	4.97	5.21*	4.58*
I feel a sense of purpose in the work that I do.	4.85	4.95	4.72
I have a good amount of autonomy in my work.	4.78	4.99	4.52
If I could start over I would pursue the same career I am in now.	4.74	5.33*	3.96*
I am satisfied with my current employment.	4.31	5.27*	4.57*

Acknowledgments

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Appendix

To understand the relationship between specific coursework and evaluations of curriculum relevance, we performed a regression analysis using game curriculum relevance as the outcome variable and courses taken as predictor variables. The table below shows the results of this analysis. Courses with higher coefficients (closer to 1) are associated with higher curriculum relevance scores and courses with lower coefficients (near zero) are not associated with ratings of curriculum relevance. Courses with negative coefficients indicate that taking that course is more likely to result in lower curriculum relevance ratings.

Course	Coefficient	p=
Game Design*	0.691*	0.0291*
Music Courses	0.586	0.2619
Game AI	0.514	0.1343
Internship/Co-op	0.460	0.1184
Game Platform Hardware Architecture	0.444	0.2034
Virtual Worlds	0.421	0.1939
Business of Gaming	0.403	0.1399
Graphics	0.337	0.2266
Interactive Storytelling	0.321	0.1629
Level Design	0.120	0.6669
Audio Design	0.048	0.8922
Game Production	0.042	0.8759
Games and Learning	0.034	0.9148
Game Research	0.007	0.9770
Animation	-0.060	0.8687
Project Courses	-0.091	0.7247
Game Engine Scripting	-0.121	0.6801
Games and Society	-0.268	0.3918
Game Programming	-0.271	0.2909
3D Modeling	-0.391	0.2787
Critical Game Studies	-0.417	0.0766
Visual design	-0.454	0.1433
Serious Games	-0.468	0.0640

Multiple R-squared: 0.2897, Adjusted R-squared: 0.1296

F (23,102) =1.809, p-value = 0.02353

A similar regression analysis was performed using coursework to predict reported income. The coefficients reported here are much larger as they represent the change in income associated with having taken each course. Courses with negative coefficients indicate that taking that course is more likely to result in lower income.

Here, coursework is show to account for 35% of the variance in income and several courses reach individual levels of significance (asterisked in the table below). Note that income has a much wider range of variability as compared to coursework relevance and this may contribute to the larger adjusted R-squared reported. Two caveats are necessary, however. Courses that are less common are more sensitive to individual variation in income. For example, music courses are the least common courses taken from the list but the respondents who took the course earn relatively high salaries, thus giving music courses a higher weight and salary coefficient. Moreover, more recent course offerings are negatively impacted in this model because they are more common among recent graduates who are likely to earn lower salaries.

Course	Coefficient	p=
Music Courses*	31964	0.034*
Animation*	22910	0.037*
Virtual Worlds	15961	0.103
Project Courses	14699	0.068
Game Production	13423	0.114
Game AI	2139	0.248
Game Engine Scripting	9939	0.276
Critical Game Studies	9045	0.194
Visual design	7092	0.456
Interactive Storytelling	4170	0.561
Serious Games	2092	0.777
Business of Gaming	-603	0.941
Game Platform Hardware Architecture	-2636	0.804
Games and Society	-4020	0.677
Graphics	-8743	0.316
Games and Learning	-9557	0.325
Internship/Co-op	-12160	0.199
Game Programming	-12966	0.112
Game Research	-14990	0.061
3D Modeling*	-26325	.019*
Game Design**	-28694	.003**
Audio Design**	-35933	.001**
Level Design**	-40471	.001**

Multiple R-squared: 0.4845, Adjusted R-squared: 0.3543

F (23,91) =3.719, p-value = 0.0000038