

Examining the Relationships between Virtual Environments and Teens

A Research Paper Presented to

Dr. Dimiter Dimitrov

George Mason University

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Quantitative Research Methods in Education

Ellen M. Nosal

George Mason University

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Introduction

Research Questions

The research questions to be addressed are the following:

1. Are there differences in the gender of teens that access virtual environments?
2. Are there minority and age classifications, in the teens that access virtual environments?
3. Are there differences in living situations between teens that access virtual environments?

Method

Sample

The potential participants in the study were identified as children between the ages of 12 and 17 years of age from across the United States ($n = 1102$). After removal of outliers and 12 year old children the remaining sample size of ($n = 937$) was used for the statistical evaluation. This sample represents approximately 4.3% of the nation's teens in 2008. In the sample all continental states were represented in this survey with a majority of responses from California 14.3% ($n = 89$), Pennsylvania and Texas with 5.7% ($n = 53$), New York with 5% ($n = 47$), and Ohio at 4.9% ($n = 46$). Of the teens surveyed, males ranged from 13-19 year olds accounted for 50.4% ($n = 472$) and females between 13 and 19 claimed 49.6% ($n = 465$) of the make-up. Ethnicities represented in the data set include White 79.6% ($n = 746$), Black or African-American 12.2% ($n = 114$), Asian or Pacific Islander 2% ($n = 19$), Native American 1.3% ($n = 12$), 3.4 % ($n = 32$) of teens surveyed opted not to answer the question. With regard to age of teens surveyed frequencies included: 13 YO at 19.3% ($n = 181$), 14 YO at 16.5% ($n = 165$), 15 YO at 21.7% ($n = 203$), 16 YO at 20.9% ($n = 196$), 17 YO at 21.6% ($n = 202$).

Data

The data items selected were used to study the relationship of teens and their use of virtual environments. As virtual environments become more available and technology able to access these environments, more teens are using this platform for entertainment, education and social interaction. Specific questions, for this paper, from this large data set were used to identify correlations between race, age, and residency among US teens.

Data Collection

The data used in this study was obtained from the Pew Research Center (Pew Internet and Research Project). This data was gathered in February of 2008 via phone callback survey to households throughout the continental United States. This survey was used in a report titled *Teens, Video Games and Civics* (Lenhart, Kahne, Middaugh, MacGill, & Evans, 2008). This report looked at teens and their interaction with a variety of gaming situations. This paper's statistical data focuses on the 10% of the population sampled who had interaction with virtual environments.

Data Analysis

All data were analyzed using SPSS statistical analysis program with an alpha level of .05 used for all statistical tests. Many variables were ruled out of the original data set and only the variables of kids age, kids sex, ethnicity and community type were used for this paper to focus on the specific research questions asked. For kid's age responses fell between 12-17, and the responses from 12 year olds was omitted to reflect teens. The quantities of male ($n = 4752$) and females ($n = 465$) were identified and ethnicities broken down. Outliers were removed and data clear for use for the parameters of the research questions.

To answer the first question, determining if there are differences in the gender of teens that access virtual environments.

A multiple regression analysis was run to investigate the second question of whether minority classification, years of experience, or level of education could be used as predictors of teachers' current salaries?

The third question about differences in current salary across minorities, years of experience, or educational level was investigated using an ANCOVA and adjusting for beginning salaries.

Results

Research Question 1

The initial test for determining a correlation between current and beginning salaries shows the Pearson's Correlation ($p = .000$), further, the results show there is a statistically significant difference between education and the difference in gain salary, $F(2,99) = 7.654$, ($p = .001$). Additionally, there is a statistically significant difference between years of experience and the difference in gain salary, $F(2,99) = 48.36$, ($p = .000$). There is also a statistically significant difference in the interaction between education and minority classification, $F(1,99) = 10.77$, ($p = .001$). There is no statistically significant between gain and the other variables or their interaction. Table 2 summarizes this data.

The post hoc test shows that there is a statistically significant main effect for education. Specifically, the 95% confidence intervals show that a teacher with a master's degree earns at least \$3,138 but not more than \$10,380 than a teacher with a bachelor's degree, while a teacher with a doctorate earns at least \$35,895 but not more than \$52,770 than a teacher with a bachelor's degree, and a teacher with a doctorate earns at least \$28,773 but not more than \$46,374 than a teacher with a master's degree. Table 3 summarizes this data.

The post hoc test for years of experience shows a statistically significant main effect. Specifically, the 95% confidence intervals show that a teacher with 6 – 10 years of experience earns at least \$22,281 but not more than \$33,212 than a teacher with 1 – 5 years of experience, while a teacher with over 11 years of experience earns at least \$38,588 but not more than \$57,888 than a teacher with 1 – 5 years of experience and a

teacher with over 11 years of experience earns at least \$9,654 but not more than \$31,329 than a teacher with 6 – 10 years of experience. Table 4 summarizes this data.

Figure 1 illustrates the estimated marginal means. As seen in the figure there is interaction between minority classification and education. The more education achieved the higher the gain in salary. Also of note, is the higher salary for minorities at the master's degree over the rest of the population but a much lower salary at the bachelor's degree.

Research Question 2

The results show that 78% of the variance in current salary is explained by the variance in years of experience, minority classification, and education degree (R squared = .779), further there is a statistically significant relationship between the current salary and years of experience, minority classification, and education degree $F(3, 107) = 130.3, (p = .000)$. Years of experience and education degree have a statistically significant unique contribution in explaining the variance in current salary, years of experience ($p = .000$) and education degree ($p = .023$); however, minority classification does not have a unique contribution, minority classification ($p = .137$). The regression equation for predicting current salary using years of experience (X_1), minority classification (X_2), and education degree (X_3) is $\hat{Y} = 38,901X_1 - 3,347X_2 + 4,544X_3 - 11,656$. Tables 5, 6, and 7 summarize the data result of the multiple regression.

Research Question 3

The results show that the assumption of equal slopes is met, years of experience and beginning salary $F(1,101), p = .790$.

The results show that there is a statistically significant difference for current salary controlling for beginning salary on education $F(2,102) = 6.098$, $p = .003$, years of experience $F(2,102) = 27.168$, $p = .000$, minority classification $F(1,102) = 4.417$, $p = .038$, and the interaction of education and minority classification $F(2,102) = 11.777$, $p = .001$; however, the interaction between education and years of experience was not statistically significant ($p = .927$).

A post hoc test on the adjusted means was run for years of experience after controlling for beginning salary. The results show that there is a statistically significant difference contrasting teachers with 1-5 years of experience to teachers with 6-10 years of experience $F(1,107) = 53.307$, $p = .001$. Further, the teachers with 6-10 years of experience earn at least \$16,930 but not more than \$29,550 than the teachers with 1-5 years of experience at the 95% confidence interval. The results for teachers with 1-5 years of experience contrasted to teachers with over 11 years of experience show a statistically significant difference $F(1,107) = 32.551$, $p = .000$. Further, the teachers with over 11 years of experience earn at least \$24,383 but not more than \$50,350 than the teachers with 1-5 years of experience at the 95% confidence interval. The results for teachers with 6-10 years of experience contrasted to teachers with over 11 years of experience show a statistically significant difference $F(1,107) = 6.289$, $p = .014$. Further, the teachers with over 11 years of experience earn at least \$2,960 but not more than \$25,293 than the teachers with 6-10 years of experience at the 95% confidence interval. Tables 8, 9, 10, and 11 summarize this data.

Discussion

The findings of this study suggest that the years of experience and the education attained effect the current salary of teachers. These findings were anticipated based on the traditional compensation scales used in school districts. There were some interesting findings that were not anticipated.

Specifically, there was no relationship between gender and current salary found in other job areas. The teaching profession has traditionally been staffed with more females than males especially in the lower grade levels. Many of these teachers are not the primary source of income for their household. This has produced a low incentive performance system receiving low wages and minimal increases in salary. One of the limitations of this study was the low number of female teachers randomly selected in the sample.

Another finding that had implications was the lack of relationship with current salary and minority classification. Minorities are not well represented in the teaching profession. With increasing minority student populations, the need for more minority representation in faculties has greater importance. As more minorities move into the teaching profession, a balanced population should provide data supporting relationships between minority classification and current salary.

Continued research remains to be done in the area. A limitation of this study was the sample size and demographics. Repetitive studies using more samples at the elementary, secondary, and graduate levels would produce findings that may lead to changes in the compensation systems used by schools.

References

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Table 1

Demographics of Study by Years of Experience

<i>Years of experience</i>	<i>n</i>	<i>Gender</i>		<i>Ethnicity</i>		<i>Education</i>		
		<i>Male</i>	<i>Female</i>	<i>Minority</i>	<i>Non-minority</i>	<i>BS</i>	<i>MS</i>	<i>PhD</i>
1-5	98	55	43	25	73	75	23	0
6-10	10	10	0	0	10	5	4	1
11+	3	3	0	0	3	0	0	3

Table 2

*Tests of Between-Subjects Effects**Dependent Variable: Gain*

Source	df	F	Sig.
Corrected Model	11	27.288	.000
Intercept	1	831.559	.000
Education	2	7.654	.001
Minority	1	3.388	.069
Gender	1	.220	.640
Experience	2	48.358	.000
Education*Minority	1	10.773	.001
Education*Gender	1	1.488	.225
Minority*Gender	1	.401	.528
Education*Minority *Gender	1	1.146	.287
Education*Experience	1	.045	.832
Error	99		
Total	111		
Corrected Total	110		

a. R Squared = .752 (Adjusted R Squared = .724).

Table 3

Multiple Comparisons

Dependent Variable: Gain
Tukey HSD

(I) Degree	(J) Degree	Mean Difference	Sig.	95% Confidence Interval	
				Lower Bound	Upper Bound
Bachelor's	Master's	-\$6,758.99*	.000	-\$10,379.97	-\$3,138.01
	PhD	-\$44,332.74*	.000	-\$52,770.40	-\$35,895.07
Master's	PhD	-\$37,573.75*	.000	-\$46,373.96	-\$28,773.54

* The mean difference is significant at the .05 level.

Table 4

Multiple Comparisons

Dependent Variable: Gain
Tukey HSD

Years (I) Exper	Years (J) Exper	Mean Difference	Sig.	95% Confidence Interval Lower Bound Upper Bound	
1-5	6-10	-\$27,746.90*	.000	-\$33,212.34	-\$22,281.45
	Over 11	-\$48,238.23*	.000	-\$57,887.93	-\$38,588.53
6-10	Over 11	-\$20,491.33*	.000	-\$31,329.05	-\$9,653.61

* The mean difference is significant at the .05 level.

Table 5

Model Summary

<i>Model</i>	<i>R</i>	<i>R²</i>	<i>Adjusted R²</i>	<i>Std. Error of the Estimate</i>
1	.886 ^a	.785	.779	\$9,635.002

a. Predictors: (Constant), Years of Experience, Minority Classification, Education Degree

Table 6

ANOVA

<i>Model</i>		<i>df</i>	<i>F</i>	<i>Sig.</i>
1	Regression	3	130.266	.000 ^a
	Residual	107		
	Total	110		

a. Predictors: (Constant), Years of Experience, Minority Classification, Education Degree

b. Dependent Variable: Current Salary

Table 7

Coefficients

<i>Model</i>	<i>Unstandardized Coefficients B</i>	<i>Standardized Coefficients β</i>	<i>t</i>	<i>Sig.</i>
1 (Constant)	-11655.8		-3.792	.000
Minority Classification	-3346.529	-.069	-1.497	.137
Education	4544.277	.120	2.302	.023
Years of Experience	38900.995	.803	15.326	.000

b. Dependent Variable: Current Salary

Table 8

*Tests of Between-Subjects Effects**Dependent Variable: Current Salary*

Source	df	F	Sig.
Corrected Model	9	123.485	.000
Intercept	1	24.712	.000
Education	1	5.118	.026
Experience	1	.757	.386
Education*Salbegin	1	1.099	.297
Experience*Salbegin	1	.071	.790
Minority*Salbegin	1	.907	.343
Error	101		
Total	111		
Corrected Total	110		

a. R Squared = .917 (Adjusted R Squared = .909).

Table 9

*Contrast Results**Dependent Variable: Current Salary*

Source	df	F	Sig.	95% Confidence Interval	
				Lower Bound	Upper Bound
Contrast	1	53.307	.000	-\$29,550.53	-\$16,930.26
Error	107		.000		

Contrast coefficients 1-5 years 1 vs 6-10 years 2

Table 10

Contrast Results

Dependent Variable: Current Salary

Source	df	F	Sig.	95% Confidence Interval	
				Lower Bound	Upper Bound
Contrast	1	32.551	.000	-\$50,350.46	-\$24,383.50
Error	107		.000		

Contrast coefficients 1-5 years 1 vs over 11 years 3

Table 11

Contrast Results

Dependent Variable: Current Salary

Source	df	F	Sig.	95% Confidence Interval	
				Lower Bound	Upper Bound
Contrast	1	53.307	.014	-\$25,293.50	-\$2,959.66
Error	107		.000		

Contrast coefficients 6-10 years 2 vs over 11 years 3

Figure 1

Estimated Marginal Means of Gain

