Why Are Students Leaving Fairfax County Public Schools?

A Quantitative Analysis of Dropout Rates, Reasons and Relevance

Dannette Allen –Bronaugh & Clara Hauth

George Mason University

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Dr. Michelle Buehl

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Abstract

Graduating from high school is a lifetime achievement for many students. It marks the passage into adulthood and is required for continuing education and employment. High School graduation is a priority as emphasized in the No Child Left Behind (NCLB) legislation and the Race to the Top (RTT) policies of the Obama administration. Current research is aimed at providing insight and strategies to increase graduation rates while addressing the concerns regarding high school dropouts. The state of Virginia and Fairfax County Public Schools (FCPS) have made increasing graduation rates one of their top priorities in recent years. This study analyzes data from a FCPS public database, which reports numbers of high school dropouts by high school, ethnicity, gender and reason for dropping out. The intent of this study was to examine this information in relation to the reported reasons and confounding variables involved with high school dropouts. Results indicate that gender has an impact on family issues as the reason given for dropping out. Reasons for dropping out are consistent over a three-year period and ethnicity, though not conclusive, may also have some impact on reasons reported for high school dropouts. The research study results reiterates much of the concerns of current research in the field and indicates a continued need for educational, social and emotional support for students who are contemplating leaving school before graduating.

Keywords: Dropout, high school

Why Are Students Leaving Fairfax County Public Schools? A Quantitative Analysis of Dropout Rates, Reasons and Relevance

Increasing High School graduation rates is a top priority of the No Child Left Behind Act of 2002 (NCLB) and the current administration's Race to the Top (RTT) policies regarding closing the achievement gap and improving high school graduation rates (No Child Left Behind, 2002, Pub. L. No. 107-10, § 115 Stat. 1425; American Recovery and Reinvestment Act 2009, Pub. L. No. 111-5, §123 Stat. 115). These governmental measures have demonstrated an increased interest in understanding the trends in high school graduation in the United States. According to the recent reports by National Center for Education Statistics (NCES), High School graduation rates need to improve, and the graduation rates for minorities although increasing, have not achieved satisfactory levels (Cataldi, Laird, & Kewal-Ramani, 2009).

The renewed focus on increasing high school graduation rates has led to increased involvement and scrutiny at the State and local government levels. Fairfax County Public Schools (FCPS), in Virginia has an additional impetus in their reporting of student dropouts. Included in their public site are reports, which show student dropout rates with regard to student, school, and reported reasons for dropping out of school (FCPS, 2010). Understanding recurrent behaviors and trends regarding student dropout rates may help educators to ascertain programs and gain insight into how they may be able to decrease student attrition rates (Sum et al., 2003).

Recent research regarding possible risk factors for students dropouts, include several indicators, which have been identified that have an impact on student dropout rates. These include failing grades, family socio-economic status, moving/absenteeism, grade retention and disciplinary problems (Bowers, 2010). Students and schools often reiterate these reasons as they attempt to deal with student dropout rates. Research is needed to investigate the relationship of

reasons students give for dropping out of school based on gender and ethnicity in order to gain a better understanding of the issues affecting dropout rates. Understanding who these students are and if their reasons for dropping out are the same or different based on gender or their ethnic background needs to be investigated more. With a greater understanding of each student and their indicators for dropping out, we can develop a better way to assist students in graduating from high school with a diploma. To investigate these concerns this research intends to analyze the factors affecting high school students' reasons for dropping out of FCPS.

The purpose of this research study was to identify the trends in high school dropout rates in FCPS as they pertain to student gender, ethnicity, and both self and school reported reasons. Indentifying these reasons may impact the educational practices of educators, counselors and administrators as they work to help all students graduate from high school.

Research Questions

1. Are there gender differences in regard to the reported reasons that high school students drop out of FCPS?
2. What reasons given for student dropouts are most highly correlated with dropout rates over a three-year period of time?
3. What impact do these reasons have on FCPS school dropout rates in regard to factors such as cluster, gender and ethnicity?

Methods

Data from the department of information technology public FCPS website reports on dropouts were analyzed to determine the relative impact of gender, ethnicity, and reasons for student dropout on total dropout rates regarding 24 public schools for the 2005-2008 school years.

Sample

The sample for this research was gathered in FCPS whose total student population is reported at 173,573 students with the following demographics; African American 10.5%, American Indian 0.2%, Asian American 18.5%, Hispanic 18.1%, Multiracial 6%, and Caucasian 46.2%. The sample data included 24 general high schools with an average annual enrollment of 51,000 students. The actual sample used for this study included 1204 student and their reasons for dropout based on their school and ethnicity (FCPS, 2010). The demographic reported are those used in the data set, even though these are different reported categories than those used by FCPS on their website to report overall student demographics. The demographic categories reported in the rest of this paper are consistent with those reported in the data set. The demographics of this current sample include 1.95% American Indian/Alaskan, 0.78% Asian/Pacific Islander, 1.57% Black, 3.5% Hispanic, 0.52% Multiracial, 3.88% Undesignated, 0.44% White (FCPS, 2010). The breakdown based on gender was 1.31% female and 1.75% male.

Measures

A report listing data based on the number of students who drop out from school in FCPS over a three-year period was analyzed. The Virginia Department of Education (VDOE) defines a dropout as "a student who leaves school for any reason and does not return to school by October 1 of the following school year" (FCPS, 2010). This definition does not include those students who graduate or transfer to another school. The data obtained included dropout rates for each high school in FCPS along with the number of students in seven ethnic groups (American Indian/Alaskan Native, Asian/Pacific Islander, Black, Hispanic, Multiracial, Undesignated and White). Also listed were ten reasons that both schools and student's report as to why they drop

out of school (achievement problems, behavioral difficulties, employment, expulsion, family, financial hardship, health problems, maximum age, moved/current status unknown or personal) defined by the VDOE.

A student who has low achievement, low motivation, or low interest and drops out of school would be classified under achievement problems as a reason for dropping out of school. Students classified as behavioral difficulties that drop out are described as being suspended or expelled from school, incarcerated, runaways, truant, or have poor relationships with peers or adults. Students who leave school to take a job, join the armed forces, enter the Job Corps, or a similar program would be classified as dropping out of school for employment reasons. A student classified as expulsion for dropout reason has left school involuntarily due to expulsion approved by appropriate school authorities. A student, who is needed at home, became pregnant, or married and left school would be classified as dropping out of school for family reasons. A student who drops out of school for financial hardship would be described as leaving school due to extreme poverty, or working to support self or family members. Students who drop out of school for physical or mental illness, injury or substance abuse would be classified as dropping out due to health problems. Special education students who reach the maximum age to receive services and drop out of school would be classified as maximum age. A student who no longer resides in the area or whose current location is unknown would be classified for the reason as moved, current status unknown for the purposes of compiling this data. Finally if a student were over 18 and still eligible to receive services but left voluntarily would be classified as dropping out due to personal reasons.

Procedures

Data provided on the FCPS website for the 2005-06, 2006-07, and 2007-08 school years were retrieved and further broken down prior to being entered into Statistical Package for Social Sciences (SPSS). Student dropout data were further categorized by school cluster in addition to reporting the high school attended. Collection of data was completed during the. For this selection student dropouts were categorized by one of 8 county clusters, then by specific high school. Student data were then entered regarding ethnicity, gender and coded for the ten reported dropout reasons. Based on the size of the data set, and the analysis, which needed to be conducted for this project, different portions of the total data set were used. In order to analyze the dropout reasons listed by year, all 1204 students were entered into SPSS by gender and reason.

Data Analysis

Data analysis included a chi-square test of association to determine if there were differences in student dropouts in regards to gender for their reasons for dropping out of high school. Second a multiple regression analysis was conducted to determine which reasons given for student dropouts were more highly correlated with reported dropout rates over a three-year period of time. Independent variables included the ten reported reasons and year reported. The dependent variable was the dropout rates. The final analysis included an analysis of covariance (ANCOVA). This was conducted to investigate the three high schools with the highest dropout percentages against ethnicity and the top identified reasons given for student dropouts.

Results

The first analysis was based on the chi-square test of association, which was conducted to determine if there were gender differences in regards to the reasons given for high school

dropouts. The Pearson Chi-Square (9, N =1204) = 69.833, $p < .001$ which indicates that there are differences between gender and reasons for dropping out of school (see table 1). A ten-way contingency table analysis was run to determine which differences between the observed and the expected for each reason by gender was the major contributor to the statistical significance of the chi-square value. Results from the standardized residuals indicate that for males the given reason of family was less than expected (see table 2). For female students the reasons of family and health problems were more than expected and personal reasons were less than expected.

The next analysis used multiple regression to determine whether the reasons reported by students for dropping out of school were consistent over a three-year period. The predictors were the ten reasons and the criterion variable was the school year. The linear combination of reasons was significantly related to the year, F (2,27) = 2.826, p = .007 (see Table 3). The sample multiple correlation coefficient was R = .416 indicating that approximately 17% (r^2 = .173) of the variance of the reason in the sample can be accounted for by the year (see Table 4). Based on the standardized coefficient reasons have a larger explanatory contribution to why students dropout of school than year. The unique contribution of reason as a predictor was β = -.416, p = .025 explains 17% of the variance in reason above and beyond the year (see table 5).

The final analysis conducted was an ANCOVA to determine if there were any differences between reasons given for dropping out and ethnicity. The covariate in this analysis was school cluster, which does not have a relationship with the grouping variables due to the random assignment of cluster by FCPS and the fact that school clusters have varied over the years. Before conducting the ANCOVA diagnostic tests were run to ensure that the data met the assumptions of homogeneity of regression slopes and variance. Levene's test was significant F (5,146) = 6.465, $p < .001$ indicating that the homogeneity of variance was not met (see Table 6).

In addition a scatter plot indicates that there is not linearity between the variables. The homogeneity of regression slopes for ethnicity and school was also not met F (5,140) = 5.070, p < .001 (see Table 7). Therefore the results must be interpreted with caution due to the fact that there is not linearity between the variables.

The following ANCOVA test should not have been run because the assumptions were not met. However, for the purpose of demonstrating mastery of ANCOVA data analysis for this paper, the omnibus test was run, but the post-hoc tests was omitted since there was no homogeneity of variance. Evidence that there were group differences by ethnicity F (5,145) = 22.808, p < .001, $\rho\eta^2$ = .440. Therefore 44% of variance in reasons can be explained by ethnicity. The partial eta-squared effect size indicates that the effect is large. There is evidence that the covariate, school cluster, is statistically significant F (1,145) = 98.493, p < .001 (see table 8).

Discussion

The student dropout data shows that there is a significant difference between males and females on their reason for dropping out of school. Females gave family reasons, which include pregnancy, parenthood, marriage, and being needed at home as well and health problems, which include physical or mental illness, injury, or substance abuse as reasons for dropping out of school more than expected. However, males gave family, as a reason for dropping out, less frequently than expected. This finding seems reasonable when the psychology of gender is considered. One might expect females to have higher incidence of reasons relating to family due to pregnancy, and parenthood tend to affect the female population more than it does males in the long run. Females also higher rates health problems, which include physical or mental illnesses, injury or substance abuse over males.

Results of the multiple regression indicated that there was a consistent relationship between reasons and years reported. However, there was not a linear relationship or homoscadasticity. The results indicate that the reasons for dropping out are more statistically correlated to dropout rates than years. This is not surprising in that the reasons for dropping out do not vary significantly from year to year. These results also indicate an increased need for a more in-depth understanding and counseling of individuals based on their reasons for dropping out. Looking into the reasons students drop out and the impact counseling would have on these individuals would be an important factor to address.

Based on previous research, it is not surprising that ethnicity plays a role in student dropout. Ethnicity and family income impact higher dropout rates for high school students at the national level (Cataldi, Laird, & Kewar-Ramani, 2009). Creating avenues for support such as career coaching or counseling for diverse populations are also indicated from these results.

Additionally our study results must be viewed with caution due to the fact that homogeneity of variance was not met and that there was not a linear relationship between the dependent and independent variables, therefore the ANCOVA other under circumstances, would not have been run.

Limitations

There are many limitations to this study to include the usage of a very large data set, which although part of the public record, was not verifiable. Also, since the data was obtained from student and staff self-reported measures, accuracy cannot be fully ascertained. This study does not address student status regarding special education and English language learners. This population of students, drop out of school at higher rates than the general population (Roy & Mishel, 2008). Other limitations include researchers' limited knowledge and skills in data

mining, which were often large and tenuous. The researchers were as thorough as possible but do understand that they will need continued practice mining data and know that they will benefit from the feedback of their work by peers and professors to hone their research skills.

Recommendations for Future Research

Future research needs to include more specific interventions to target this diverse population of students. As indicated by national policies and programs, these students need to be in the focal point of school board discussions, administrative reforms and school wide interventions. Additional research might also include mixed method research studies with survey information and interviews from student dropouts to aid in the understanding of this national crisis. The future is at stake and if we do not continue to try to solve the current dropout phenomenon we will lose one of our most precious and valuable resources (Swanson, 2006).

Reflections

Dani

Conducting this research in a collaborative fashion has been a beneficial experience. We initially wanted to conduct a preliminary analysis of data from Clara's school in order to document the effectiveness of the math intervention she created and has been implementing for the last four years. Since we were not able to get HSRB approval without going through FCPS, we decided to put that plan on hold and look for a data set to use to write our final paper. Since Clara and I have collaborated together on projects in the past and we know that we work well together, we felt that working together on this project would allow us to draw on each of our strengths as well as discuss different aspects and perspectives on the research.

Neither of us had any experience using large data sets, so the initial process of locating the data was a bit intimidating, however working together allowed us to discuss these frustrations

and push each other forward. Once we decided on the data to use, it was time consuming to input the data into SPSS and we were able to assist each other with this instead of having to complete this all alone. It was also useful when we began to analyze the data and run the different statistical test to be able to talk through what we were investigating as well as what the interpretation of the results. I am an auditory and visual learner so being able to problem solve out loud with a colleague who understood what I was saying was very beneficial. I feel that doing this helped me to have a stronger understanding of the statistical tests and why they are conducted and what types of information are provided.

I feel that this final project helped me to understand all that was taught this semester. I see why after each homework you asked us information about the final project and had us think about what we were learning, because waiting until the end to run all the analysis was very time consuming. However, I did not feel that I even understood or knew enough information as we were learning about the statistics to even understand what types of data we would need at the end. I almost wish as a class we walked through all the steps to writing the paper for area as we were learning the material. For instance if we started the class and we were shown how to utilize a large data set and what types of information to gather and then used this data each week in class to learn the various statistical tests, I would have had a better understanding of the process. All in all, this project and the class have given me a better understanding of how data analysis is done. Now when I read and evaluate research conducted by others I will be able to understand what the researchers are reporting. I greatly appreciate the highly organized manner in which this class was conducted and I know that because of all that I learned I would be better able to conduct and analyze quantitative data in the future.

I had an epiphany regarding this project after running all of the data and beginning the analysis. I realized that it would have been beneficial to have you teach how to go to a data set on the first night of class and demonstrate what variables are needed in order to complete this final project. This way, for people unfamiliar with looking at data sets could see the step-by-step process. The data that is mined that first week of class could then be used for the in class demonstrations of the analysis we are learning. This way it would have made more sense determining what data sets to choose as well as how to set up the variables. Because every week for homework the data sets were provided for us, we never were responsible for learning how to set up the actual SPSS file. I think this would be a beneficial addition to the class and would have helped increase my understanding of all we had learned in class.

Clara

Conducting this research project has been an amazing learning opportunity for me. I feel that I am better able to understand all that we learned in class. I was very upset when we found out that HSRB would not approve our project without going through FCPS. The project we wanted to conduct is something that Dani and I would like to peruse in the future and I think that we have a better understanding of how to conduct that research by having completed this project.

Dani and I have collaborated previously on projects and know that we work well together and that we are able to draw on each of our strengths as we work together. It was also natural for us to collaborate on this project, since we worked together weekly, to learn the material, to complete our homework, as well as to study for quizzes and exams. I knew that working with Dani would afford us the opportunity to discuss different aspects and perspectives of the research and draw on each of our strengths.

Determining what data set to use was very frustrating, because there are so many available and it was difficult at times to interpret what was being reported and to understand how to transfer this data into what was needed in order to complete this project. Again it was useful to have Dani to collaborate with in order to determine what data to look at and how the information we gained from this project could be useful not just for this class but to me professionally. I found it useful to use data available from the FCPS website, because it has relevance to me personally as a teacher in the county. Looking at the dropout rates for students is helpful for me as a middle school special education teacher and gives me ideas on how to be a positive influence on their lives of the students I teach to hopefully impact them to stay in school. Once we located the school dropout data we were excited to run the statistical tests in SPSS and to analyze the data.

One of the most beneficial aspects to this project was that it allowed me to understand more clearly how to analysis data, which I have found very beneficial as I read, research articles. I now understand better the data researchers are presenting and why they ran particular tests. I know that all I have learned in this class will help me as I conduct future quantitative research.

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Table 1

Results of Chi-Square Tests on gender and the reason for dropping out of school

Chi-Square Tests	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	69.833[a]	9	0.000
Likelihood Ratio	73.071	9	0.000
Linear-by-Linear Association	0.003	1	0.953
N of Valid Cases	1204.000		

Table 2

Cross tabulation Chi-Square report based on the number of students who gave a particular reason for dropping out of school by gender

		Reasons										
Gender		Achievement	Behavior	Employment	Expulsion	Family	Financial	Health	Max age	Moved unknown	Personal	Total
Males	Count	230.0	140.0	86.0	8.0	13.0	20.0	9.0	3.0	171.0	32.0	712.0
	Expected Count	231.8	127.7	77.5	5.3	39.6	21.9	15.4	1.8	167.9	23.1	712.0
	Residual	-1.8	12.3	8.5	2.7	-26.6	-1.9	-6.4	1.2	3.1	8.9	
	Std. Residual	-0.1	1.1	1.0	1.2	-4.2	-0.4	-1.6	0.9	0.2	1.9	
	Adjusted Residual	-0.2	1.9	1.6	1.8	-6.8	-0.6	-2.6	1.4	0.4	3.0	
Female	Count	162.0	76.0	45.0	1.0	54.0	17.0	17.0	0.0	113.0	7.0	492.0
	Expected Count	160.2	88.3	53.5	3.7	27.4	15.1	10.6	1.2	116.1	15.9	492.0
	Residual	1.8	-12.3	-8.5	-2.7	26.6	1.9	6.4	-1.2	-3.1	-8.9	
	Std. Residual	0.1	-1.3	-1.2	-1.4	5.1	0.5	2.0	-1.1	-0.3	-2.2	
	Adjusted Residual	0.2	-1.9	-1.6	-1.8	6.8	0.6	2.6	-1.4	-0.4	-3.0	
Total	Count	392.0	216.0	131.0	9.0	67.0	37.0	26.0	3.0	284.0	39.0	1204.0
	Expected Count	392.0	216.0	131.0	9.0	67.0	37.0	26.0	3.0	284.0	39.0	1204.0

Table 3

Multiple regression ANOVA investigating the reason students reported for dropping out of school over a three-year period

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	27496.850	2	13748.425	2.826	0.077[a]
	Residual	131358.617	27	4865.134		
	Total	158855.467	29			

a. Predictors: (Constant), year, Reason

b. Dependent Variable: total

Table 4

Model Summary showing the variance of the reason given by students for dropping out of school over a three-year period

					Change Statistics				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change
1	0.416[a]	0.173	0.112	69.75051	0.173	2.826	2	27	0.077

a. Predictors: (Constant), year, Reason

Table 5

Coefficient demonstrating the unique contribution of reason as a predictor

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations		
		B	Std. Error	Beta			Zero-order	Partial	Part
1	(Constant)	119.167	41.591		2.865	0.008			
	Reason	-10.533	4.434	-0.416	-2.376	0.025	-0.416	-0.416	-0.416
	year	-1.350	15.597	-0.015	-0.087	0.932	-0.015	-0.017	-0.015

a. Dependent Variable: total

Table 6

Levene's test of Equality of Error Variances for the dependent measure reasons to investigate homogeneity of variance for reasons and ethnicity

F	df1	df2	Sig.
6.465	5	146	0.000

a. Design: Intercept + School + Ethnicity

Table 7

Tests of between subject effects investigating homogeneity of slopes for ethnicity and school

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	922.923[a]	11	83.902	22.652	0.000
Intercept	437.153	1	437.153	118.024	0.000
Ethnicity	259.202	5	51.840	13.996	0.000
School	152.788	1	152.788	41.250	0.000
Ethnicity * School	93.887	5	18.777	5.070	0.000
Error	518.551	140	3.704		
Total	3594.000	152			
Corrected Total	1441.474	151			

a. R Squared = .640 (Adjusted R Squared = .612)

Table 8

Omnibus between subjects test investigating the variance in reason by ethnicity

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	829.035[a]	6	138.173	32.714	0.000	0.575
Intercept	930.123	1	930.123	220.215	0.000	0.603
School	416.006	1	416.006	98.493	0.000	0.405
Ethnicity	481.676	5	96.335	22.808	0.000	0.440
Error	612.438	145	4.224			
Total	3594.000	152				
Corrected Total	1441.474	151				

a. R Squared = .575 (Adjusted R Squared = .558)