

## DOCUMENT RESUME

ED 382 257

JC 950 240

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 TITLE Exploring Retention and Attrition in a Two-Year Public Community College.  
 INSTITUTION Patrick Henry Community Coll., Martinsville, VA.  
 PUB DATE 94  
 NOTE 19p.  
 PUB TYPE Reports - Research/Technical (143)

EDRS PRICE MF01/PC01 Plus Postage.  
 DESCRIPTORS Academic Achievement; Attrition (Research Studies); Community Colleges; Ethnic Groups; Longitudinal Studies; \*Persistence; \*Predictor Variables; Public Colleges; \*School Holding Power; \*Student Attrition; \*Student Characteristics; Two Year Colleges

## ABSTRACT

In an effort to improve retention and accountability at Patrick Henry Community College (PHCC), in Virginia, a study was undertaken to track first-time student cohorts entering in fall 1988 through fall 1992 and gather data on student demographics and outcomes. The study examined data for 721 students entering in fall 1988, 761 in fall 1989, 824 in fall 1990, 801 in fall 1991, and 736 in fall 1992, and included the following results: (1) retention rates after 1 year ranged from a low of 28.9% for the fall 1990 cohort to a high of 34.6% in fall 1988; (2) 40% of the fall 1988 cohort who left after 1 year had no intention of completing a degree or certificate program; (3) retention rates after 2 years were 17.5% for 1988, 18.5% for 1989, and 16.3% for 1990; (4) the most significant predictors of student retention, in order of importance, were student goals, hours enrolled per semester, number of credit hours completed, semester grade point average (GPA), and overall GPA; and (5) in general, attrition rates after 1 year were higher for female students, black students, part-time students, and those in the age ranges of 23-35 and 45-50. The study recommended that student classifications be taken into account when determining attrition rates and that PHCC should identify students who are first enrolled in unclassified academic categories and target them for retention programs and services. (KP)

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# Exploring Retention And Attrition In A Two-Year Public Community College

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## EXPLORING RETENTION AND ATTRITION IN A TWO-YEAR PUBLIC COMMUNITY COLLEGE

This study is designed to explain the retention and attrition in a two-year public community college in order to: 1) report the results of a longitudinal study on retention and attrition pattern, 2) use the results of this study to improve the retention rate at the college, and 3) help the accountability - improvement committee at the state level establish a valid and reliable set of indicators of student retention/attrition for institutional effectiveness among community colleges.

The construction of different theories on student retention and attrition has led to some disagreement about the appropriate explanation of student departure (Tinto, 1986). This is particularly true in two-year public community colleges. Most theories on student departure do not take into account the external forces that impact upon student participation in college. Even Tinto's (1982) interactional theories of departure have some limitation on explaining external community forces. Current forms of interactional theory are neither particularly well suited to the study of non-residential institutions or of departure among community college students. Neither are they easily adapted to the practical needs of two-year college administrative planners (Tinto, 1986, p. 367). There are two main reasons for this argument: 1) demographic and socio-economic factors relating to community college students are somewhat different than those students attending four-year colleges. That is, on the average, community college students are older, attend part-time more often, do not reside on campus, have lower degrees of goals, have lower high school grades, have more modest financial resources, are employed for more hours, have more family responsibilities, have relatively little interaction with other students outside of class, and are not strongly involved in campus activities (Baird, 1991); 2) external forces, particularly those related to community forces in the immediate geographical environment of the college's service area, are also important in understanding

and interpreting the retention and attrition patterns at two-year public community colleges. For example, the need for training and retraining of the workforce for business, industry, and governmental agencies within any community college service area changes the social composition of student population, thus requiring different definitions and methodologies to study student departure.

**BACKGROUND:**

Although the problems of retention appear to be much more severe at community colleges, only a few studies are available; and little effort has been made to develop a theoretical model to explain retention at two-year colleges. Cope and Hannah (1975) acknowledge that the rate of attrition among community college students is considerably higher than the rates at four-year colleges. The data in Table 1 indicates how the retention rates of two-year public colleges compare with other types of institutions. Two-year public colleges have considerably lower retention rates than do four-year institutions (Astin, 1975; Beal and Noel, 1980; Letters, 1977; Leming, Saver, and Beal, 1980; Ramist, 1981).

**Table 1. Retention By Type of Institutions and First Time Enrolled**

Institution	Retention After One Year					
	1975-76		1976-77		1977-1978	
	N	%	N	%	N	%
2-Year Public	74	55	82	55	92	53
2-Year Private	27	63	29	64	30	63
Nonsectarian	12	63	12	62	12	64
Religious	15	61	17	65	18	62
4-Year Public	99	68	103	67	104	66
4-Year Private	207	71	222	71	227	71
Nonsectarian	66	73	72	73	76	74
Religious	141	71	150	70	151	68

Source: Lenning, O.T., Beal, P.E., Saver, K. Retention and Attrition: Evidence for Action and Research. Boulder: NCHEMS, 1980.

Slightly over one half of the two-year public college students do not return in the second year as opposed to one third in four-year public colleges (mean retention rate of the two-year

public colleges  $\cong$  54 percent, vs. the mean retention rate at four-year public colleges  $\cong$  67 percent). Community college students have multiple roles that frequently compete for a student's time. These roles which have been suggested as reasons for nonpersistent behavior (Metzer & Bean, 1987; Tinto, 1987), include temporary (stop-out) or permanent (drop-out). Baird (1991) states that the problems of community college "drop-out" stems from the great diversity of students enrolled. This diversity is created by: 1) students who intend to transfer to four-year colleges who may transfer before completing the program they are enrolled in; 2) students who enroll in technical training, and who after a course or two in technical fields, such as computer programming or accounting, leave the college; 3) students who want skills and, having obtained the level of skill demanded by their employer, or prospective employer, leave before completing a course. A good example would be computer and secretarial programs, where students leave when they reach a certain level of typing, word processing or shorthand skill; 4) students who are simply curious about a subject, or interested in self-development, and leave when they feel they have learned enough.

Some studies on student retention have focused on variables that are associated with retention and attrition. Daniels (1990) conducted a longitudinal study of the entering students at Brookdale Community College and concluded that retention was higher among students who planned to graduate and those who planned to transfer. Brooks-Leonard (1991) found that educational objectives, full-time/part-time status, employment status, age, and first-term GPA are significant predictors on student retention. Lower retention was associated with students seeking courses only. Also first-term GPA was higher for students who had been retained. Voorhees' (1987) study on community college persistence also concluded that the only factors related to persistence were gender, purpose for enrolling, and intent to return. Feldman (1993) also focused on the study of factors influencing community college persistence at Niagara

County Community College. She concluded that high school GPA, age, full-time/part-time status, and ethnicity were predictors of retention. Based on a logistic regression model to select predictors of retention, she concluded that, the lower the high school GPA, the greater chance the student will drop out. The present study has some similarities and differences. Unlike Feldman (1993) who has focused on pre-enrollment variables, the present study was intended to focus on the process variables to explore the retention pattern and analyze the influence of student/institutional variables on retention and attrition. The methodology of research employed in this study was longitudinal; and the analysis of data was consistent over time, using the exploratory data analysis and multivariate techniques.

#### **THE COLLEGE:**

Patrick Henry Community College is one of the 23 two-year comprehensive public institutions of higher education operating under the Statewide Virginia Community College System. The college is located in the City of Martinsville which is 45 miles south of the City of Roanoke in Virginia and 25 miles north of the North Carolina border. In the fall semester of 1993 the headcount enrollment of the college was 2805, and approximately 71 percent of enrollment came from the two rural counties of Patrick and Henry. Three out of every four students (75 percent) were enrolled as part-time, and female students outnumber male students (61 percent). The social composition of students was 82 percent white, 17 percent black, and 1 percent other minority groups with the average age being 28.8 in the fall of 1993. The average number of semesters for completing a degree program was 6 semesters (minimum = 2, maximum = 6), and more than 90 percent of the graduating student class of 1993 stated that they worked while attending PHCC. Data collected between the academic years 1990 - 1993 from 2450 high school students applying for admission to college, revealed that 64 percent of students claim that neither of their parents had a bachelor's degree. Only 11 percent of

students declared that one of their parents had a bachelor's degree, and 24.9 percent did not respond.

#### **METHODOLOGY OF RESEARCH:**

This is a longitudinal study using the data on a single campus for student cohorts who first enrolled in the fall semesters of the academic years of 1988 - 1989 through 1991 - 1992. Such designs are the most internally valid for studying attrition and afford a measure of confidence in findings and associated conclusions that is not available with other designs (Terenzini, 1987, p. 30). Longitudinal data from historical AKT files\* for the first-time student cohort population was provided by Administrative Data Services on a dBase 3+ file and stored on a personal computer. The process for this longitudinal tracking study was based on the identification number of students at the time they initially registered at PHCC in a given fall semester. Whenever the same student identification number in the student records database showed active course registration for the same semester of the following year of initial registration, the student was assumed to be retained at PHCC. The data elements incorporated in this study for each year's first-time student cohort included three clusters of predictor variables: group one were students' demographic variables - gender, age, and ethnic background; group two were academic achievement variables - overall GPA, first semester GPA, hours completed, and hours per semester; and finally group three variables were -- enrollment status of students (full-time, part-time), curriculum of study, and academic levels (freshman, sophomore, developmental, and unclassified). The dependent variable used in this study was a dichotomous variable of persisters and leavers. The following questions guided this research: a) What was the retention pattern of the first-time students enrolled in the fall of

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\* Historical AKT files consist of permanent data on students, instructors, and classes stored by the Virginia Community College System at the host

1988 after one year, two years, three years, and four years by ethnic background?; b) What was the retention pattern of the first-time students enrolled in the fall of 1988 after one year, two years, three years, and four years by gender?; c) What was the nature of data on demographic and academic variables for students who first enrolled in the fall 1988 and did not return in fall of 1989?; and d) What were the significant variables that contributed in determining the retention and/or attrition rates?

#### DEFINITIONS:

Definitions have a direct impact on the nature of design and methodology of any research study. Four categories of students' attrition and retention have been used in this study (Terenzini, 1987, p. 22): 1) persister: a person who is continuously enrolled (for the period of time under study) in a certificate or degree-completion study-this individual graduates on time; 2) stopout: a student who leaves for a period of time but who subsequently returns to continue study-this student graduates eventually; 3) dropout: a student who leaves and does not return during the period under study-this student, of course, may subsequently prove to be a stopout; 4) attainer: a student who leaves prior to certificate or degree completion, but after achieving a personal goal. For example, completion of a particular course, or acquisition of a particular skill. Note that the above categories of students are not mutually exclusive because an individual who is an attainer may return for further studies and eventually become a persister. The starting time for this study was Fall 1988, and the ending time was Fall 1992. First-time freshman students include all students who enrolled in any given fall and attended PHCC for the first time; and retention rate is defined as the percentage of first-time students in a given fall semester who returned to PHCC in subsequent fall semester. Due to the open-access policy of community colleges, these institutions rarely have any control on the input variables; and therefore, the design of any longitudinal retention and attrition study requires a lot of time and

attention. Also, such studies may not be as accurate as the studies done in four-year institutions where the student populations are more homogeneous and consistent by nature.

#### STATISTICAL PROCEDURES:

Several statistical techniques were used in this study. Multi-year data on students was provided by Administrative Data Services on dBase 3+ files. Various data management procedures were utilized to prepare the data to be used for statistical analyses. To answer questions a, b, and c stated in the methodology of this report, multi-year AKT\* files were merged based on student identification numbers followed by Exploratory Data Analysis (Tucky, 1977). Hartwig and Dearing (1979) argue that by using EDA, a researcher can learn as much as possible about a variable or set of variables before using data to test theories of social science relationships. Several procedures on descriptive statistics and visual displays were used to examine the data and visually explore the distribution of values for various student groups based on demographic and academic variables. Part of the data was transformed to fit the criteria for approximate normal distribution. To answer question d stated in the methodology of this report, logistic regression was used to accommodate a dichotomous dependent variable of persisters and leavers with both discrete and continuous variables. This is a multivariate technique that can be used to predict a binary dependent variable from a set of independent variables (SPSS, Advanced Statistics, 1993). Tables 2 through 5 and Table 7 were generated using exploratory data analysis procedures. Table 6 was generated using EDA procedures and stepwise logistic regression. By default, a variable was entered into the model if the probability of its score statistic was less than .05 and was removed if its removal statistic (conditional, wald, or likelihood ratio) had a probability greater than or equal to .10 (SPSS, Advanced Statistics, 1993, p.30). Table 6 reports the results of logistic regression with variables that were included, the R-Square of the model, and significance of each variable in the model.

To assess how the variables fit the overall model, a classification table was generated, and comparison was made between the prediction and the observed outcomes. Of the students in the retention category, 70.12 percent were correctly classified. Of the students in the attrition category, 93.44 percent were correctly classified. In all, 84.18 percent of the 721 students who first enrolled in Fall 1988 were correctly classified as the cohort for retention and attrition in this study.

## ANALYSIS OF DATA:

### The First-Time Student Population

The headcount enrollment for fall 1988 - 1992 of the first-time students that are included in this study are presented in Table 2 and Table 3, along with the distribution of each year's cohort group by ethnic and gender background.

**Table 2.** Headcount Enrollment of First-Time Students by Ethnic Background, Fall 1988 to Fall 1992.

FALL SEMESTER	RACE			TOTAL
	WHITE	BLACK	OTHERS	
1988	630	88	3	721
1989	674	85	2	761
1990	733	86	5	824
1991	679	116	6	801
1992	602	127	7	736

**Table 3.** Headcount Enrollment of First-Time Students by Gender, Fall 1988 to Fall 1992.

FALL SEMESTER	GENDER		TOTAL
	FEMALE	MALE	
1988	450	271	721
1989	416	345	761
1990	485	339	824
1991	443	353	801
1992	431	305	736

## Retention Rates of the First-Time Student Population

Retention rates for the first-time student population are presented in Tables 4 and 5.

**Table 4.** Retention Rates of the First-Time Students By Ethnic Background, Fall 88- Fall 92.

FALL SEMESTER		RACE		TOTAL
		WHITE	BLACK	
After 1 year	1988	35.5	28.5	34.6
	1989	33.0	22.4	31.9
	1990	29.8	21.0	28.9
	1991			33.2
After 2 years	1988	17.2	20.5	17.5
	1989	18.5	18.9	18.5
	1990	16.4	16.3	16.3
After 3 years	1988	14.3	12.5	14.2
	1989	13.2	12.9	14.1
After 4 years	1988	9.8	7.9	9.7

**Table 5.** Retention Rate of First-Time Students by Gender, Fall 1988 to Fall 1992.

FALL SEMESTER		GENDER		TOTAL
		FEMALE	MALE	
After 1 Year	1988	33.6	36	34.6
	1989	35.8	27.0	31.9
	1990	26.2	33.0	28.9
	1991	33.0	34.4	33.2
After 2 Years	1988	17.5	17.4	17.5
	1989	20.2	16.5	18.5
	1990	14.6	18.6	16.3
After 3 years	1988	12.5	17.0	14.2
	1989	15.9	9.9	14.1
After 4 years	1988	8.6	11.4	9.7

Retention rates are shown after one year, two years, three years and four years. The overall retention rates after one year for 1988 through 1991 cohorts range from the low of 28.9 percent in Fall 1990 to a high of 34.6 percent in Fall 1988. The retention rates of the white student cohort were higher than black and slightly higher than other minority groups. The lowest retention rate after one year for blacks occurred in Fall 1990 (21 percent), and the highest was 28.5 percent in Fall 1988. With the exception of Fall 1989, male retention rates were higher than female. The lowest retention rates were 26.2 percent for female in 1990 and 27.0 percent for male in 1989. Among all three racial groups, retention rates were the highest for the "Other" minority group, followed by white and then black (Note: Total first-time fall enrollments for the other minority group for Fall 1988-92 was 23). This pattern persists even when subgroups of race are combined with the variable of gender. Retention rates after two years for the 1988-90 cohorts range from the low of 16.3 percent in Fall 1990 to a high of 18.5 percent in Fall 1989. Despite their higher retention rate after one year, the white students experienced slightly lower retention rates than black students after two years.

The lowest retention rate after two years for both groups occurred in Fall 1990 (white students 16.4 percent and black students 16.3 percent). It is important to note that the rates of retention have decreased from 34.6 after one year to 17.5 percent after two years for the 1988 cohort. Retention rates after three years for cohorts of 1988 and 1989 were almost equal (14.2 percent for 1988 and 14.1 percent in 1989). White students experienced slightly higher retention rates than blacks after three years. Female student retention rates after three years were lower for 1988 cohort by 4.5 percent and higher in 1989 by 6 percent than the male retention. The retention rate after four years for the fall 1988 cohort was 9.7 percent which was the lowest among all retention rates in this study.

Table 6 displays the frequency and the percentage of predictor variables that were used in this study.

**Table 6.** Frequency and Percentage Distribution of Variables Used in the Analysis.(N=720)

RETENTION AFTER ONE YEAR (N=249)			ATTRITION AFTER ONE YEAR (N=471)		
	Number	Percent		Number	Percent
<u>Total</u>	249	35	<u>Total</u>	471	65
<u>Status</u>			<u>Status</u>		
Full-T	102	40.9	Full-T	54	11.5
Part-T	139	55.8	Part-T	417	88.5
<u>Gender</u>			<u>Gender</u>		
Male	99	39.8	Male	177	38
Female	150	60.2	Female	294	62
<u>Race</u>			<u>Race</u>		
White	223	89.5	White	405	86
Black	25	10.0	Black	63	13
Others	1	0.4	Others	3	1
<u>Goals</u>	***		<u>Goals</u>	***	
Level 5	48	19	Level 5	288	61
Other Levels	201	81	Other Levels	183	39
<u>Age</u>			<u>Age</u>		
Mean		23.6	Mean		36.5
Min.		17	Min.		22.0
Max.		56	Max.		79.0
St. Dev.		9	St. Dev.		12.2
<u>HrsComp</u>	***		<u>HrsComp</u>	***	
Mean		48.5	Mean		10.6
Min.		2.0	Min.		1.0
Max.		112.0	Max.		90.0
St. Dev.		26.6	St. Dev.		14.0
<u>HrsSem</u>	***		<u>HrsSem</u>	***	
Mean		9.7	Mean		5.2
Min.		1.0	Min.		1.0
Max.		20.00	Max.		20.00
St. Dev.		5.6	St. Dev.		4.5
<u>Overall GPA</u>	***		<u>Overall GPA</u>	***	
Mean		2.74	Mean		2.93
Min.		0.71	Min.		1.07
Max.		4.00	Max.		4.00
St. Dev.		0.83	St. Dev.		1.07
<u>Sem GPA</u>	***		<u>Sem GPA</u>	***	
Mean		2.78	Mean		3.00
Min.		3.00	Min.		1.87
Max.		4.00	Max.		4.00
St. Dev.		0.96	St. Dev.		1.06

\*\*\* Statistically Significant as Predictors of Retention. R-Square=0.69 For The Logistic Regression Model (Reg-Step).

The statistical analysis using logistic regression indicated significant variables contributing in determining the retention/attrition rates. In order of importance to retention these variables were student's goal (academic level), hours per semester (HrsSem), hours completed (HrsComp), semester GPA (SemGPA), and overall GPA. Age, race, gender, and status of students were not significant predictors of retention. This study indicated that attrition rates were higher for female students, black students, part-time students, and those in the age range of 23-35 and 45-50, and those who took one or maximum two classes in the fall of 1988. Also, attrition was higher for those students whose Hours Completed and Hours per Semester were significantly lower than those who retained. Students' Overall GPA and Semester GPA were also significant predictors of retention. GPA was associated with higher attrition. The data were further analyzed according to students' intended goals and the academic levels of students (Table 7). By far, the highest rate of attrition occurred in the level 5 or unclassified category. In other words, of the 472 students who did not return, 288 or 61 percent were in the unclassified category. This implies that a major proportion of those who left the college had no intention of completing a certificate or degree programs, and they only attended PHCC to achieve a personal goal, i.e., acquisition of a particular skill or completion of a particular course. This group of students falls within the definition of "attainers" given by Terenzini (1987) described earlier in this report.

Table 7. Frequency and Percentage of Curriculum Levels Used In The Study (N=721)

Academic Levels	Retention After One Year		Attrition After One Year	
	N	% of Total Retained	N	% of Total Left
1. FreshTransf	13	5.00	67	14.00
2. Develop *	2	1.00	—	00.0
3. Fresh- Dip	—	00.0	6	1.00
4. Fresh- Cert	34	14.00	56	12.00
5. Unclassified	48	19.00	288	61.00
6. Fresh- AAS	15	6.00	54	12.00
7. Soph -Tran	76	31.00	—	00.0
8. Soph -Dip	4	2.00	—	00.0
9. Soph- AAS	57	23.00	—	00.0
All Levels	249	100	471	100

\* Developmental Tracking at PHCC Started In 1990.

## DISCUSSION AND CONCLUSION:

This study was designed to explore the data on student retention and attrition; to use the results of data analysis to improve the retention pattern; and finally help the Accountability-Improvement Committee at the state level to establish a reasonable set of indicators of student retention for institutional accountability at the community college level.

It would appear that the students' goals for attending college is a very strong predictor of retention. This finding has been supported by Baird (1991), Voorhees (1987), Daniels (1990), and Brooks-Leonard (1991). Of the 721 first-time student population (table 7) who enrolled in the fall of 1988 at PHCC, 471 or 63 percent did not return in the fall of 1989. Further analysis of data indicated that a high percent of students (288 or 40 percent of the fall 1988 cohort) who left

the college after one year had no intention of completing a degree or a certificate program. The data on this group of students that fall under the category of attainers was one of the concerns in this research and should not be accounted for in the future retention / attrition studies. It is the group of unclassified students that are unique on each community college campus and the pattern for these students looks different due to the immediate influence of the social forces in the college's service area. Also, this study found that the number of credit hours per semester, the number of credit hours completed, the overall GPA, and semester GPA of students were significant predictors of student retention.

Demographic and socioeconomic factors, combined with open-access policy at the community college level, influence the rates on attrition/retention. Astin (1993) acknowledges that the college retention rates are misleading. He believes that it would be unfair to compare the retention rates of different types of institutions. Institutions that admit large numbers of less-well prepared students will tend to have low retention rates, regardless of how effective their retention programs are.

The larger implication of this research is that community colleges should take more of the known variables into consideration when attempting to create a model for determining attrition rates. What has been missing in determining attrition has been the acknowledgment of social forces in the immediate community of the college, which directly inflates the retention/attrition statistics. The policy implication of the findings of this research on campus is that the college should identify those student who are first enrolled as unclassified students. Administrators, faculty and counselors should be aware of such a group of students. New programs and services should be designed and offered to these students earlier in the semester, so that attrition rates may decline.

Finally, the Accountability-Improvement at the state level should not be used to assert greater state control over the colleges. The findings of this research indicate that, to establish a reasonable set of indicators of student retention the Virginia State Postsecondary Review Entity (SPRE), should work under the 1992 Amendment of Higher Education Act which develops Review Standards and should follow Astin's (1993) suggestion. Each college should develop an internal standard (the expected retention rate) against which the institution can judge its own performance (the actual rate). In effect, the institution is being compared with itself: "How well are we doing, given the students we admit?"

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