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ABSTRACT

A statewide retention study conducted in fall 1992 revealed significant differences in graduation rates among Virginia Community College System (VCCS) institutions. To determine factors related to student graduation and differences in graduation rates for VCCS colleges, an analysis was undertaken of the characteristics of fall 1989 entering students and the characteristics of students from this cohort who received an award (i.e., certificate, diploma, or associate degree) by June 1992. Results of the analysis included the following: (1) graduation rates for the 23 colleges in the VCCS ranged from 53.8% to 4.8%, with a system-wide average of 10%; (2) with respect to graduates system-wide, 53% were female, 82% were under 25, 86% were white, and another 86% were enrolled full-time; (3) while age, race, and gender were related to receiving an award, they were not as strongly related as the program selected, college location, and student course load; (4) occupational-training students were more likely to graduate than transfer students; (5) the probability of receiving an award for urban students was only about half of that for non-urban students; (6) students who initially enrolled full-time were five times more likely to graduate than part-time students, though the 3-year period commonly used in graduation studies is generally not enough time for part-time students; and (7) colleges with large numbers of part-time freshmen had lower graduation rates, even if the tracking time was extended to 7 years. (MAB)

Graduation Rate Differences Within the VCCS

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GRADUATION RATE DIFFERENCES WITHIN THE VCCS

Graduation rate definitions and their calculation are a simple matter for four-year institutions. College or university-wide rates typically are defined as the number of students receiving an award in four or more years divided by all of the students forming the entering class. This measure has been accepted generally as an index of success of a primary institutional purpose. Its extension to two-year colleges has not been as widely accepted, particularly as a measure of purpose or success for community colleges. What defines the entering class, or the denominator, is not as straight-forward for institutions like community colleges that have multi-purpose missions. Several community college functions do not move students through a program toward an award, and these differences are often used in response to reports critical of low graduation rates for community colleges.

Recently, graduation rates have received even more attention because they are almost always included as data elements under outcomes assessment and institutional effectiveness activities. Additionally, renewed interest in community colleges as lower-division baccalaureate colleges and recently enacted federal Student Right-to-Know legislation have led to increased reporting of these rates. More specifically for the VCCS, the State Council of Higher Education has formalized a graduation rate report (J1) for Virginia and will be coordinating federal reporting requirements. This increased focus has not led to a widely accepted definition of an "entering class" for community colleges, nationally or in Virginia. The group is now defined broadly as first-time freshmen at both levels.

Although community colleges as a group are well practiced at answering questions about rates lower than those at four-year colleges, questions concerning rate differences among community colleges are more recent. The Fall 1992 (1985 freshmen cohort) SCHEV Retention Study reported rate differences as high as 40 percentage points among VCCS colleges. This paper presents information relevant to these differences. First, this paper compares entering groups, upon which the rates are based, across colleges on several typical student characteristics. Second, it describes characteristics of cohort members actually receiving an award for each college. Finally, possible relationships between cohort characteristics and receiving an award are examined. The analysis reveals that statistically there is an association for each characteristic and graduating and that student enrollment status, full-time or part-time, and college location, urban or not urban, are strongly related to obtaining an award.

VCCS Graduation Rates

All freshmen (curriculum-placed) first enrolling in Fall 1989 were selected for each college. This cohort provides the most recent data while meeting the standard for 'tracking period' (150% of program length) now specified for state and federal studies. Graduation rates were calculated for the period ending June 1992 (see Table I).

TABLE I
GRADUATION RATES FOR FALL 1989 COHORT
FIRST-TIME, CURRICULUM-PLACED STUDENTS (FRESHMEN)

COLLEGE	NUMBER	PERCENT
BRCC	82	26.9
CVCC	13	12.9
DSLCC	43	53.8
DCC	114	38.9
ESCC	13	25.5
GCC	34	14.7
JSRCC	17	4.8
JTCC	13	7.7
LFCC	79	20.9
MECC	95	19.0
NRCC	54	16.9
NVCC	196	5.2
PHCC	20	7.4
PDCCC	23	12.9
PVCC	33	9.1
RCC	35	18.2
SSVCC	40	17.8
SWVCC	73	9.6
TNCC	71	7.0
TCC	123	6.2
VHCC	86	25.2
VWCC	100	11.9
WCC	27	34.7
VCCS	1384	10.8

The pattern across colleges is very close to the SCHEV studies of 1983 and 1985 freshmen classes. Once again there is wide variation among colleges and an overall rate of roughly 1 in 10 students receiving an award[1] within three years.

[1] Awards include career studies certificates, certificates, diplomas, and associate degrees.

Description of College Cohorts

Profiles of each college's cohort, based on five typical characteristics, are shown in Table II. The table displays number and percent of entering students for each category of sex, race, age, program area, and enrollment status (FTPT). For statistical purposes, age and race factors were regrouped so that all factors had only two categories. Table III shows the highest and lowest college percentages and the overall VCCS percentage for each student factor. It is clear from Tables II and III that students forming the cohorts differ substantially across colleges on these characteristics.

TABLE II

FALL 1989 COHORT CHARACTERISTICS

	SEX				RACE				AGE				PROGRAM				FTPT			
	FEMALE		MALE		OTHER		WHITE		UNDER 25		25 AND OVER		TRF		O/T		F-T		P-T	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
BRCC	165	54	140	46	14	5	291	95	262	86	43	14	173	57	132	43	223	73	82	27
CVCC	59	58	42	42	8	8	93	92	84	83	17	17	47	47	54	53	54	53	47	47
DSLCC	42	53	38	48	5	6	75	94	65	81	15	19	43	54	37	46	65	81	15	19
DCC	139	47	154	53	43	15	250	85	271	92	22	8	73	25	220	75	257	88	36	12
ESCC	22	43	29	57	20	39	31	61	31	61	20	39	13	25	38	75	27	53	24	47
GCC	143	62	89	38	24	10	208	90	186	80	46	20	119	51	113	49	126	54	106	46
JSRCC	195	55	161	45	117	33	239	67	130	37	226	63	30	8	326	92	109	31	247	69
JTCC	85	50	85	50	36	21	134	79	137	81	33	19	71	42	99	58	104	61	66	39
LFCC	227	60	151	40	20	5	358	95	338	89	40	11	236	62	142	38	286	76	92	24
MECC	340	68	160	32	15	3	485	97	324	65	176	35	241	48	259	52	351	70	149	30
NRCC	166	52	154	48	21	7	299	93	260	81	60	19	119	37	201	63	248	78	72	23
NVCC	1900	51	1861	49	1101	29	2660	71	2982	79	779	21	2310	61	1451	39	1795	48	1966	52
PHCC	144	53	127	47	37	14	234	86	193	71	78	29	101	37	170	63	118	44	153	56
PDCCC	115	65	63	35	84	47	94	53	99	56	79	44	72	40	106	60	69	39	109	61
PVCC	201	56	161	44	54	15	308	85	330	91	32	9	286	79	76	21	244	67	118	33
RCC	134	70	58	30	32	17	160	83	130	68	62	32	84	44	108	56	83	43	109	57
SsVCC	118	52	107	48	107	48	118	52	106	47	119	53	109	48	116	52	135	60	90	40
SwVCC	357	47	408	53	14	2	751	98	529	69	236	31	205	27	560	73	358	47	407	53
TNCC	559	55	460	45	315	31	704	69	772	76	247	24	550	54	469	46	507	50	512	50
TCC	934	47	1039	53	457	23	1516	77	1375	70	598	30	958	49	1015	51	881	45	1092	55
VHCC	185	54	155	46	20	6	320	94	303	89	37	11	81	24	259	76	284	84	56	16
VWCC	488	58	352	42	82	10	758	90	710	85	130	15	513	61	327	39	494	59	346	41
WCC	52	67	26	33	1	1	77	99	67	86	11	14	29	37	49	63	66	85	12	15
VCCS	6770	53	6020	47	2627	21	10163	79	9684	76	3106	24	6463	51	6327	49	6884	54	5906	46

TABLE III

SUMMARY OF VCCS COHORT CHARACTERISTICS

FACTOR	CATEGORY	RANGE	VCCS
Sex	Female	43% - 70%	53%
Age	<25	37% - 92%	76%
Race	White	52% - 99%	79%
Program	O-T	21% - 92%	49%
FTPT	Full-time	31% - 88%	54%

Tables IV and V profile the entering cohort who graduated in the same way that the above tables profile all of the cohort.

TABLE IV

FALL 1989 COHORT GRADUATE CHARACTERISTICS

	SEX				RACE				AGE				PROGRAM				FTPT			
	FEMALE		MALE		OTHER		WHITE		UNDER 25		25 AND OVER		TRF		O/T		F-T		P-T	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
BRCC	43	52	39	48	1	1	81	99	72	88	10	12	38	46	44	54	74	90	8	10
CVCC	11	85	2	15	.	.	13	100	12	92	1	8	7	54	6	46	11	85	2	15
DSLCC	22	51	21	49	1	2	42	98	38	88	5	12	20	47	23	53	52	98	1	2
DCC	52	46	62	54	10	9	104	91	112	98	2	2	30	26	84	74	107	94	7	6
ESCC	5	38	8	62	4	31	9	69	11	85	2	15	1	8	12	92	7	54	6	46
GCC	25	74	9	26	3	9	31	91	30	88	4	12	21	62	13	38	28	82	6	18
JSRCC	10	59	7	41	8	47	9	53	10	59	7	41	3	18	14	82	16	94	1	6
JTCC	5	38	8	62	2	15	11	85	11	85	2	15	1	8	12	92	12	92	1	8
LFCC	50	63	29	37	4	5	75	95	75	95	4	5	57	72	22	28	75	95	4	5
MECC	67	71	28	29	1	1	94	99	68	72	27	28	36	38	59	62	87	92	8	8
NRCC	34	63	20	37	4	7	50	93	36	67	18	33	13	24	41	76	48	89	6	11
NVCC	98	50	98	50	66	34	130	66	170	87	26	13	122	62	74	38	164	84	32	16
PHCC	8	40	12	60	1	5	19	95	15	75	5	25	5	25	15	75	14	70	6	30
PDCCC	18	78	5	22	9	39	14	61	17	74	6	26	11	48	12	52	16	70	7	30
PVCC	21	64	12	36	2	6	31	94	32	97	1	3	25	76	8	24	29	88	4	12
RCC	27	77	8	23	7	20	28	80	25	71	10	29	16	46	19	54	23	66	12	34
SsVCC	30	75	10	25	18	45	22	55	18	45	22	55	6	15	34	85	35	88	5	13
SwVCC	55	75	18	25	.	.	73	100	52	71	21	29	21	29	52	71	69	95	4	5
TNCC	40	56	31	44	14	20	57	80	61	86	10	14	31	44	40	56	57	80	14	20
TCC	59	48	64	52	32	26	91	74	91	74	32	26	58	47	65	53	94	76	29	24
VHCC	46	53	40	47	3	3	83	97	74	86	12	14	15	17	71	83	83	97	3	3
VWCC	63	63	37	37	4	4	96	96	82	82	18	18	47	47	53	53	72	72	28	28
WCC	16	59	11	41	1	4	26	96	25	93	2	7	7	26	20	74	26	96	1	4
VCCS	805	58	579	42	195	14	1189	86	1137	82	247	18	591	43	793	57	1189	86	195	14

TABLE V

SUMMARY OF COHORT GRADUATE CHARACTERISTICS

FACTOR	CATEGORY	RANGE	VCCS
Sex	Female	38% - 85%	58%
Age	<25	45% - 98%	82%
Race	White	53% - 100%	86%
Program	O-T	24% - 92%	57%
FTPT	Full-time	54% - 98%	86%

Differences (Table V) between the colleges with the highest and lowest percentages of a student type are about as large for graduates as for the entire cohort. Comparing Tables III and V reveals that there is less variability among the graduates than among those in the entering cohort. In other words, relatively more of the graduates are female, less than 25, white, and enrolled full-time in O-T programs. This suggests that certain student categories may produce disproportionate numbers of graduates.

Likelihood of Graduating for Different Types of Students

Relationships between characteristics of students forming the cohorts and receiving an award were examined. To assess the relationships, any factor with more than two levels was regrouped into two categories. For example, age was reduced to '25 and older' and '24 and below'. For each of the five student factors, the probability of graduating for students in each factor's categories was estimated. The same procedures were performed on an additional factor, Urban, based on service region population[2]. In each case, there was a statistically significant relationship between the student factor and graduating or not graduating. Likelihood ratio estimates for the factors are listed in Table VI. A ratio of 1.2 indicates that the students in that category are 1.2 times more likely to graduate; that the probability of graduation for this category is 20% greater; that 120 graduates would be expected from this category for every 100 from the other; etc. The ratios are adjusted for factors listed under "Controlling For".

[2]A college was designated "Urban" if its service region contains a city with population greater than 50,000 or a county with population greater than 100,000. See Appendix A.

TABLE VI

LIKELIHOOD RATIOS FOR SIX COHORT VARIABLES

FACTOR	CATEGORY	LIKELIHOOD	CONTROLLING FOR
Sex	Female	1.18	FTPT, Urban
Age	>24	1.18	FTPT, Urban
Race	White	1.27	FTPT, Urban
Program	O-T	1.55	FTPT, Urban
Urban	not Urban	1.84	FTPT, Program
FTPT	Full-time	5.09	Urban, Program

A likelihood ratio of 1.0 would suggest even chances of graduating for the two categories. Therefore, age (>24), race (white), and sex (female) are related to receiving an award, but not strongly. The other factors are more significant. For program (O-T vs transfer), college location (urban vs. not urban), and student load (FT vs PT) there is a strong relationship between each and graduating.

Looking at each relationship, the sex ratio is as expected. There is a higher proportion of females in the cohort and an even higher percentage of graduates. The likelihood ratio for age is not as intuitive. Most students forming the cohort and an even higher proportion who graduate are under 25, but the chances of graduating are actually a little higher for the '25 and older' group when other differences are controlled. The significance of this ratio is lessened by the fact that only 1 in 4 students in the cohort are older than 24. For race, the higher probability of whites receiving a degree is strongest for full-time non-urban students. It reverses slightly for part-time students. In brief, the relationships for these factors are not the same for all student categories included in the analysis, yet there is, overall, a greater likelihood of graduating associated with whites, females, and older (> 24) members of the cohort.

Program type better predicts receiving an award than does age, race, or sex. As is often reported, occupational-technical students are more likely to graduate than transfer students. This difference is greatest for full-time, non-urban students, but it holds for each category of FTPT and Urban. Chances of graduating are reduced for students enrolled at a college in an urban area. The probability of receiving an award for urban students is only about half of that for those in non-urban cohorts. The ratios varied little if other factors were dropped or included ("controlled for"). This suggests that while conceptually Urban appears to reference some of the same types of students categorized by the other factors, urban is independently related to receiving an award.

The likelihood ratio for full- and part-time students is over 5. In other words, students who initially enroll full-time are five times as likely to graduate. This is the strongest relationship of the six examined. Nearly as obvious is the observation that a completion period of 150 percent of program length is not long enough for students carrying less than a full-time load to complete an associate degree. This suggests that very few would graduate, necessarily resulting in low overall graduation rates and an artificially high relationship between FTPT and graduating. Yet, extending the tracking periods (J1 cohorts for 1983 and 1985) to seven years (233% of program length) only increases graduation rates by 5 percent. This increase is consistent across colleges. Colleges with large numbers of part-time freshmen do not have larger gains in graduation rate. Although it could be argued that a seven year follow-up is not sufficient, it would seem more reasonable to conclude that very few part-time freshmen complete a degree.

Whatever the answer, it is probably safest to assume that FTPT categories include students with quite different probabilities of graduating. Reporting requirements now include part-time, and a tracking period of 150 percent of standard program length is used.

Summary and Observations

For Fall 1989, slightly more than 10 percent of VCCS first-time students graduate within three years. College to college this rate varies from 4.8 percent to 54.8 percent. Students forming the entering groups also differ greatly among colleges. For students from these groups who eventually graduate, the percentage of students falling into a specific category (e.g., female) is higher for the system and for most colleges. That is, graduates tend to be more alike than is the case for the full cohort. The five factors used to describe the cohorts are related to receiving an award. There is also a relationship between graduation and whether or not the college is located in an urban area. Location and credit hours taken (FTPT) are most potent.

Cohort profiles and likelihood ratios provide a basis for predicting graduation rate differences among colleges. For example, an urban college with large numbers of part-time transfer students would be expected to have a lower graduation rate than a non-urban college that enrolls mostly full-time occupational-technical students. In this sense, the ratios for different types of entering students provide some explanation of the college differences.

This analysis raises questions about part-time curricular students. Should they be included at all in the base group for calculating graduation rates? Should they be omitted from the three-year rates? What is a sufficient time period for tracking these students? How many curricular or degree students who first enroll on a part-time basis ever graduate?

This analysis also raises questions about procedures and definitions used to classify first-time freshmen. The fact that cohort profiles are not the same for all colleges is not surprising. There are differences in the student populations served and in the institutional

(offerings) mix across colleges. These same differences could also result in some colleges having proportionately fewer first-time students placed in a curriculum, and, as seen in the graduate data above, proportionately fewer who intended to graduate. The range of these differences, however, is surprising. College differences as large as forty to fifty points for graduation rates and for the percentages of students originally classified as freshmen suggest that classification methods may also play a role in these differences. The possibility that classification differences could contribute substantially to cohort and thus graduation rate differences is surprising, however, given the importance and frequent use of the category. For example, first-time freshmen have wholly or partially formed the base group for SCHEV-OCR persistence reports, SCHEV graduation and transfer studies, and, as proposed, for federal program completion studies.

Finally, there are the normal data precautions. The student factors selected are limited. Other factors may mediate the differences. The likelihood ratios are based on system-wide data, and they are estimates. Still, the cohort data and the cohort-graduate associations are important for understanding VCCS graduation rate differences and should prove useful to individual college reviews of program completion.

APPENDIX A

Colleges Categorized as Urban and Not Urban

Urban	Not Urban
Central Virginia	Blue Ridge
Danville	Dabney S. Lancaster
J. Sargent Reynolds	Eastern Shore
John Tyler	Germanna
Northern Virginia	Lord Fairfax
Thomas Nelson	Mountain Empire
Tidewater	New River
Virginia Western	Patrick Henry
	Paul D. Camp
	Piedmont Virginia
	Rappahannock
	Southside Virginia
	Southwest Virginia
	Virginia Highlands
	Wytheville