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ABSTRACT

This article presents the results of a longitudinal study of underprepared college students. The goals was to assess the effects of coordinated programming that allowed groups of these students with the weakest academic skills to attend the same classes together and have the same counselor. In this way, the instructors and the counselors could work together as a team and the students would have a less isolated social environment than normally experienced by college students. The assumption was that these factors would work together to provide the best chance for the students to overcome their difficulties and be successful in college. The research compared students in this coordinated program with similar students whose schedules were not coordinated. The academic performance of the two groups were measured by their grades, rates of passing courses, accumulation of college credits, and retention rates. The results showed that as a group the students with coordinated schedules did not perform better than other students. The structure of the coordinated program will be reconsidered, but it is possible that one semester was not enough time for the benefits of the program to manifest themselves. Additional study is necessary. Statistical data are presented on nine tables. (VM)

THE EFFECT OF COORDINATED PROGRAMMING ON THE ACADEMIC PERFORMANCE AND PERSISTENCE OF UNDERPREPARED COLLEGE STUDENTS: A LONGITUDINAL STUDY

FRANCES GETELES[1]

INTRODUCTION

For several years prior to September 1980, The City College of CUNY SEEK Program had been using a system of coordinated programming for certain of its entering freshmen, in particular those who had the weakest academic skills and needed the most basic remediation. A group of 15 to 20 such students would be programmed together for the same English 1, College Skills 1.8 and Social Science 1.8 classes, and would be assigned to the same counselor. It was assumed that this mode of programming was useful because it: (1) would enable the instructors and the counselor to work together as a team, planning interrelated curricula and coordinated teaching strategies designed to meet the needs of the students; and (2) would provide a social environment for the students, undercutting the initial isolation which is often experienced by students entering the new and strange environment of the college. The premise of the programming was that these factors would work together to provide the best chance for the students to overcome their difficulties and be successful in college.

In addition to this Coordinated - Level 1 program, coordinated programs were run for students at a somewhat more advanced level who placed in English 2, College Skills 2 and Social Science 2.8 and who were interested in majoring in nursing (SNAP) or science and engineering (MAPES). In SNAP, in addition to the remedial courses noted above, students would take Speech and an Introduction to Nursing course. The content in their courses dealt largely with nursing-related problems and issues so that skills were taught with this content as the basis of learning. Similarly, in MAPES, the students took College Skills and English, Math, and an Introduction to the Sciences.

Some early research on the effectiveness of these coordinated programs showed that: (1) Coordinated I students did not differ in their drop-out rate at the end of one year from students starting at the same level in regular, non coordinated classes. However, more of the Coordinated students who dropped out did so in good academic standing - i.e. with Grade Point Averages (GPA's) of 2.00 or better - than did the non coordinated students (Brown, 1981), and (2) MAPES students were found to have an improved chance of successful graduation, even though many of them ultimately had majors in fields other than technology or the sciences (Kopperman and Roth, 1981).

In 1980 a decision was made to extend coordinated programming, adding coordinated programs for students with mixed placements - i.e. English 1 and College Skills 2, or English 2 and

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College Skills 1 - and for more advanced (Level II) students not necessarily majoring in nursing, technology or the sciences. This decision was based on the assumption of some members of our faculty that academic success could thereby be improved. While extending the program, however, it was also agreed that long-term research would be conducted to see whether, in fact, the academic outcome was better for the Coordinated than for the Non-coordinated students. The idea was to go beyond the one-year studies of the past and follow the students for several years. In addition the study was planned so that we could examine certain other factors which were thought to influence outcome to test the extent of their influence.

METHOD

The subjects of this study and the data collected are described below:

Subjects. The subjects of this study were students who entered City College in September 1980 and who were required to take remedial English (1 or 2) and College Skills (1 or 2). Several groups of students were included:

A. SEEK students in the following coordinated programs:

Level I: Eighty-five (85) students with the weakest academic skills, placed in English 1, College Skills 1.8, and Social Science 1.8 classes.

Mixed Level: Twenty (20) students with mixed academic skills, placed in English 1 and College Skills 2 or English 2 and College Skills 1.

Level II Regular: Twenty-one (21) students at a more advanced level of academic skills, placed in English 2, College Skills 2, and Social Science 2.8.

Level II SNAP: Thirty-nine (39) Students at a more advanced level of academic skills, placed in English 2, College Skills 2, and Social Science 2.8, and interested in majoring in nursing.

Level II MAPES: Twenty-seven (27) students at a more advanced level of academic skills, placed in English 2, College Skills 2, and Social Science 2.8, and interested in majoring in Science and Engineering.

B. Sixty-eight (68) SEEK students who were not in coordinated programs.

C. Fifty (50) non-SEEK students, randomly selected, who were registered in remedial courses in both English and College Skills during the Fall 1980 semester.

Data Collected. Data on these students were obtained from three sources: transcripts, college computer records and student financial aid records. This last source of information, however, was available for SEEK students only.

From these sources a great deal of information was available on each student, including personal, social and economic characteristics, academic characteristics upon entry to the college, and academic performance and persistence at the college.

At the heart of the present study are the academic variables, as described below:

A. Students' academic profiles at the time of college entry included their high school averages and their performances on the college's placement tests in reading, writing and mathematics. These latter tests are indices of a student's basic skills prior to his beginning coursework at the college. Although all the students included in this study showed weaknesses in reading and writing and were required to take remedial courses, there were nonetheless wide variations in their initial skills levels. This was particularly true in reading where the range of scores obtained was 5-40. By contrast, the writing test scores cover a narrower range of 2-8, although these numbers may represent great differences in skill.

   The mathematics scores differ from the other two in that not all the students required remediation. The range of scores was 5-61, which represents, on the one end, the student who needs to learn basic elementary arithmetic and, at the other extreme, the student who is ready to begin calculus.

B. Students' academic performances at the college were measured in a variety of ways. As a definition of success within the context of this study, the most commonly used measure of academic standing, the grade point average (GPA), seemed inadequate. Many of the subjects of the study took remedial courses for part or all of their first year at the college; some took them for even longer. Frequently the grades for these courses are Passed (P) or Repeat (R), grades which are not included in the GPA. Therefore a student's GPA, especially at the end of the first year, may be a very inaccurate reflection of his/her academic functioning. As an extreme example, one student may have passed all remedial courses with P grades but failed Physical Education and will have been given R grades in all his remedial courses, but earned an A in Physical Education, resulting in an A average. It was therefore necessary to use alternative measures of success based on the percentage of courses passed and the number of credits earned towards a college degree. Furthermore, the movement from remedial and developmental courses into standard college level courses was also given special attention as an index of progress.

These considerations resulted in the use of the following measures of academic functioning:

A. After one year (at the end of 6/81)

   1) Percentage of credit hours passed, defined as credit hours passed divided by credit hours attempted. (It should be pointed out that since remedial and developmental courses carry only partial credit, "credit hours" may not be the same as the credit value of courses. The "credit hours" measure, therefore, combines the weekly classroom hours of remedial and developmental courses with the credits for regular college courses.)

   2) College credits earned from all courses, remedial and non-remedial.

   3) GPA.

These first year data are presented for all students who started in the study.

B. After two years (at the end of 6/82)

1) Percentage of credit hours passed, defined as above, but covering the entire two year period.

2) Total college credits earned, to date. for all courses.

3) Credits earned for college level courses only, with remedial and developmental courses excluded.

4) Overall GPA.

5) GPA in college level courses only, excluding remedial and developmental courses.

These data are based on student accomplishments for the combined two-year period, and are presented only for those students who attended school for part or all of the second year, i.e. 9/81 - 6/82.

C. After 3 1/2 years (as of the data collection date in Spring 1984. Figures represent total accomplishments as of the end of the Fall 1983 semester.)

1) Total college credits earned.

2) GPA.

D. Students' persistence or retention in school was also noted in the following ways:

1) Whether the student completed the first year or not.

2) Whether or not the student completed the Spring 1982 semester. (This particular measure did not necessarily mean the student had completed four semesters since he/she may have taken a leave of absence and returned. It does, however, indicate whether or not the student was still actively pursuing a degree at the college. Only students present some time during the second year are included.)

3) Total number of semesters completed. (All students are included.)

4) A combined measure of retention and academic performance, defined as follows: in school Spring 1984 and GPA (a) above 2.00, (b) between 1.90 - 2.00, (c) below 1.90; or not in school Spring 1984 and GPA (d) above 2.00, (e) between 1.90 - 2.00, or (f) below 1.90.

Statistical Analyses

The effectiveness of coordinated programming is examined to determine the extent to which it helps to improve the academic performance of students. This is done by presenting the differences in academic performance between the Coordinated, Noncoordinated and Non-SEEK students, and then subjecting the differences to an analysis of covariance, in which the effects of the precollege academic characteristics of the students - high school average and reading, writing and mathematics scores - are statistically controlled, so that it is possible to determine whether there are additional differences between students which can be attributed to the educational programs in which they participated. The effect of coordinated programming on student retention is also evaluated by means of a Chi-Square (X^2).

While the crucial part of this study is the three-way comparison between Coordinated, Noncoordinated and Non-SEEK students, some data is also presented on the sub-groups within the SEEK Coordinated Skills programs.

RESULTS

Precollege Academic Characteristics

Tables I (p. 14) and II (p. 14) provide information about the academic characteristics of the students when they entered the College. Table I compares the SEEK students who participated in the Coordinated Skills program, the SEEK students who were in regular noncoordinated classes, and the control group of Non-SEEK students. There are no differences between the Coordinated and Noncoordinated SEEK students. On the other hand, the Non-SEEK students, while basically similar on the reading and writing placement test, had notably higher high school averages.

Table II provides similar information for the sub-groups of SEEK. The following points are noteworthy: (1) MAPES students have the highest high school averages among the SEEK students, falling about midway between the SEEK and Non-SEEK students; (2) Level II Coordinated students (Regular, MAPES and SNAP) have higher average reading and writing scores than the rest of the students in the study, even higher than the Non-SEEK students; (3) The Mixed Coordinated group have equally high writing scores, but very low reading scores; and (4) The MAPES students have mathematics scores as high as those of the Non-SEEK students.

College Academic Performance

Table III (p. 15) presents the means on each of the measures of academic functioning for Coordinated, Noncoordinated and Non-SEEK students. Differences between Coordinated and Noncoordinated SEEK students are very small. Coordinated students have a higher mean GPA after the first year, but the Noncoordinated students have a higher mean GPA in college level courses after the second year. Non-SEEK students appear to do better during the first two years in their rate of passing courses and of earning college credits; their grade point averages, however, are no better than those of the SEEK students. By the end of the fourth year, however, Non-SEEK students have not only earned more credits than SEEK students but have higher averages as well.

TABLE I

COMPARISON OF COORDINATED SEEK, NONCOORDINATED SEEK AND NON-SEEK STUDENTS ON ACADEMIC VARIABLES ON ADMISSION TO COLLEGE

Precollege Academic Variables	Group					
	Coordinated (N=192)		Noncoordinated (N=68)		Non-SEEK (N=50)	
	Mean	SD	Mean	SD	Mean	SD
H.S. Average	71.55	5.5	71.86	5.0	77.64	6.0
Reading Score	23.55	6.7	24.85	7.0	26.65	5.3
Writing Score	4.56	1.9	4.34	1.5	4.54	1.6
Math Score	23.89	9.3	26.87	12.2	34.00	12.9

TABLE II

COMPARISON OF SUBGROUPS WITHIN THE SEEK COORDINATED GROUP ON THE ACADEMIC VARIABLES ON ADMISSION TO COLLEGE

Precollege Academic Variables	Group									
	Level I (N=85)		Mixed (N=20)		Level II-Rg (N=21)		Level II MAPES (N=27)		Level II SNAP (N=39)	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
H.S. Average	70.88	5.8	68.67	5.7	71.24	3.6	74.50	5.0	72.61	4.9
Reading Score	20.04	5.4	17.25	4.1	27.40	5.6	29.67	3.8	28.40	4.0
Writing Score	3.05	1.1	6.00	1.1	5.81	1.2	5.11	1.9	6.11	1.3
Math Score	20.04	7.0	21.30	4.0	28.86	13.7	33.46	6.4	24.29	8.7

TABLE III

COMPARISON OF THE ACADEMIC PERFORMANCE OF
COORDINATED STUDENTS, NONCOORDINATED STUDENTS
AND NON-SEEK STUDENTS OVER A PERIOD OF FOUR YEARS(1)

Measure of Academic Performance (Means)	Group		
	Coordinated	Noncoordinated	Non-SEEK
After One Year	(N=192)	(N=68)	(N=50)
% Credit Hours Passed	60.69	58.69	69.67
College Credits Earned	10.05	10.25	14.64
GPA	1.92	1.75	1.92
After Two Years	(N=138)	(N=48)	(N=40)
% Credit Hours Passed	66.68	66.00	72.93
Credits Earned	26.20	26.52	32 70
Credits Earned in College-Level Courses Only	16.35	16.42	26.80
Overall GPA	1.93	1.96	1.94
GPA in College-Level Courses Only	1.70	1.84	1.90
After Four Years (6/84)	(N=109)	(N=39)	(N=29)
Total Credits Earned	49.23	47.64	66.83
GPA	1.88	1.86	2.10

(1)Values presented after one year are based on all students in the study, even those who withdrew in the first semester. Values for 2nd year are based on only those students who attended all or part of academic year 1981-82. Values for 4th year include only students who attended all or part of 1982-83 and 1983-84.

Table IV (p. 17) presents similar information for the sub-groups of Coordinated SEEK students. During the first year, the students in MAPES and SNAP do best generally. They pass more courses, ear . more credits and have higher GPAs. Students in the other high-level remedial group (Level II-Regular) do least well, passing fewer courses and having lower GPAs then the Level I or Mixed group. In the second year, MAPES and SNAP students continue to do best. Regulars have improved and are passing courses and earning credits at a rate comparable to that of the MAPES and SNAP students and at a higher rate than that of the Level I and Mixed level students. The Regulars however, have low GPAs like the Level I and Mixed students. By the fourth year, Level I students have earned the fewest credits; Mixed level, MAPES and Regular the SNAP students are most advanced. The SNAP students also have the highest mean GPA, while none of the other groups differ on this variable.

The significance and meaning of these findings are presented in Table V, (p. 18) which gives the results of the analyses of covariance for each of the academic performance measures and shows to what extent the differences on these measures might be attributable to high school average, scores on skills tests upon entry into college, the combined effect of these precollege academic characteristics (covariates), and, lastly, the experimental group in which the students participated.

All the measures of academic functioning are significantly related to high school average and to the combined effect of the covariates. Reading scores are significantly related to the percentage of courses passed and the earning of credits in the first two years only. And writing scores are significantly related to the earning of college credits during these two years. Mathematics scores, on the other hand, affect only the credits earned in the first year.

In thinking about these findings regarding test scores and credits earned, one should keep in mind that they are a logical outcome of the fact that the test scores determine remedial course placement, with lower scores requiring longer periods of remediation, and that remedial courses carry fewer credits than regular courses or no credits at all.

When we eliminate the effects of high school performance and test scores, experimental group membership (Coordinated, Noncoordinated, Non-SEEK) contributes very little to student performance. It is significantly related only to (1) credits earned in the first year, and (2) credits earned for college level courses only, through the second year. Looking back at Table III we see that the difference seems to be not to be between Coordinated and Noncoordinated students but between SEEK and Non-SEEK students.

A second set of analyses of covariance was performed eliminating the Non-SEEK students and thereby comparing only the Coordinated and Noncoordinated SEEK students. There are similarities, but also some noteworthy differences. These results are presented in Table VI (p. 19).

High school average is related to the passing of courses and to the GPAs in the first two years, but is no longer highly related to how many credits have been earned. Reading score is of greater significance than before, being related to almost all measures in the first two years (except first year GPA). Writing score is still related to the earning of credits, although to a somewhat lesser degree. Mathematics score and experimental condition are not related to any of the college performance measures.

TABLE IV

COMPARISON OF THE ACADEMIC PERFORMANCES OF THE VARIOUS SUBGROUPS WITHIN THE COORDINATED SEEK PROGRAM[1]

Measure of Academic Performance (Means)	Group				
	Level I	Mixed	Level II MAPES	Level II SNAP	Level II-Regular
After One Year	(N=85)	(N=28)	(N=27)	(N=39)	(N=31)
% Credit Hours Passed	53.34	59.55	72.93	75.13	49.67
College Credits Earned	7.25	11.30	12.41	13.71	10.52
GPA	1.75	2.10	2.20	2.27	1.44
After Two Years	(N=53)	(N=16)	(N=24)	(N=34)	(N=11)
% Credit Hours Passed	60.59	64.88	68.75	74.32	70.55
Credits Earned	20.72	27.13	28.29	31.15	31.46
Credits Earned in College-Level Courses Only	10.28	17.56	18.58	22.09	21.18
Overall GPA	1.85	1.82	2.03	2.07	1.80
GPA in College-Level Courses Only	1.59	1.59	1.84	1.85	1.50
After Four Years (6/84)	(N=37)	(N=13)	(N=21)	(N=31)	(N=7)
Total Credits Earned	39.81	51.08	48.86	60.65	51.08
GPA	1.82	1.85	1.87	2.01	1.85

[1] Values presented after one year are based on all students in the study, even those who withdrew in the first semester. Values for 2nd year are based on only those students who attended all or part of academic year 1981-82. Values for 4th year include only students who attended all or part of 1982-83 and 1983-84.

TABLE V

THE EFFECTS OF THE EXPERIMENTAL CONDITIONS(1) AND OF ENTRY LEVEL SKILLS
ON THE ACADEMIC PERFORMANCE OF STUDENTS

Measure of Academic Performance	Sources of Variation											
	Covariates(2)		H.S. Average		Reading		Writing		Mathematics		Experimental Condition	
	F	p	F	p	F	p	F	p	F	p	F	p
After One Year (N=310)												
% Credit Hours Passed	9.43	.001***	11.33	.001***	6.72	.01**	1.95	.16	0.39	.53	0.34	.71
College Credit Earned	19.63	.001***	13.44	.001***	4.96	.03*	15.01	.001***	6.36	.02*	5.48	.01**
GPA	5.39	.001***	12.10	.001***	0.69	.41	3.00	.09	0.05	.83	0.32	.73
After Two Years (N=226)												
% Credit Hours Passed	10.59	.001***	10.66	.001***	10.52	.001***	1.39	.24	0.56	46	0.58	.56
Credits Earned	15.49	.001***	14.34	.001***	5.85	.02*	7.31	.01**	3.85	.05	1.85	.16
Credits Earned in College-Level Courses	20.39	.001***	15.89	.001***	8.14	.01**	14.65	.001***	3.78	.05	8.59	.001***
Overall GPA	5.73	.001***	13.06	.001***	3.67	.06	0.00	.97	0.06	.81	0.85	.43
GPA in College-Level Courses Only	4.59	.001***	11.49	.001***	3.51	.06	0.07	.80	0.51	.48	0.31	.73
After Four Years (N=177)												
Total Credits Earned	6.77	.001***	9.33	.01**	1.20	.27	3.87	.05	0.90	.35	2.63	.08
GPA	3.00	.02*	8.23	.01**	0.73	.40	0.05	.82	0.01	.93	0.95	.39

(1) Coordinated SEEK, Noncoordinated SEEK and Non-SEEK

(2) The combined effect of High School Average, and Reading, Writing and Math Scores

*p ≤ .05

**p ≤ .01

***p ≤ .001

TABLE VI

THE EFFECTS OF THE EXPERIMENTAL CONDITIONS(1) AND OF ENTRY LEVEL SKILLS ON THE ACADEMIC PERFORMANCE OF SEEK STUDENTS

Measure of Academic Performance	Sources of Variation											
	Covariates(2)		H.S. Average		Reading		Writing		Mathematics		Experimental Condition	
	F	p	F	p	F	p	F	p	F	p	F	p
After One Year (N=260)												
% Credit Hours Passed	7.34	.001***	7.01	.01**	8.92	.01**	1.38	.24	0.01	.90	0.43	.51
College Credit Earned	10.84	.001***	3.28	.07	7.82	.01**	12.69	.001***	0.54	.47	0.00	.95
GPA	3.92	.01**	8.24	.01**	1.79	.18	1.32	.25	0.24	.62	0.24	.62
After Two Years (N=186)												
% Credit Hours Passed	7.52	.001***	7.58	.01**	12.56	.001***	0.23	.64	0.07	.79	0.95	.33
Credits Earned	8.16	.001***	6.28	.02*	8.76	.01**	3.74	.06	0.11	.74	0.35	.55
Credits Earned in College-Level Courses	10.34	.001***	3.54	.06	12.73	.001***	9.43	.01**	0.20	.65	0.37	.55
Overall GPA	5.76	.001***	13.55	.001***	5.90	.02*	1.14	.29	1.01	.32	0.10	.76
GPA in College-Level Courses Only	4.20	.01**	8.49	.01**	5.75	.02*	1.47	.23	2.76	.10	0.67	.41
After Four Years (N=148)												
Total Credits Earned	2.20	.07	1.66	.20	2.65	.11	1.61	.21	0.18	.68	1.13	.29
GPA	1.63	.17	2.46	.12	2.11	.15	1.64	.20	1.84	.18	0.84	.35

(1) Coordinated SEEK, Noncoordinated SEEK

(2) The combined effect of High School Average, and Reading, Writing and Math Scores

*p ≤ .05

**p ≤ .01

***p ≤ .001

The most interesting difference is that, whereas high school average and the combined covariates were significantly related to academic functioning through the fourth year when we included Non-SEEK students, this is no longer true when we look at the SEEK students alone. In fact, none of the variables studied seem to be significant determinants of the academic success of the SEEK students beyond the second year.

College Retention

Table VII (p. 21) gives the retention figures for Coordinated SEEK students, Noncoordinated SEEK students and Non-SEEK students. The number of students still in attendance at the end of the first year, the end of the second year, and the spring semester of the fourth year are given for each group. Also presented are the number of "potential graduates," defined as those students still in attendance at the end of the fourth year who have GPAs of 1.90 or better. The Non-SEEK students appear to have a higher retention rate at the end of each period. They also have a higher rate of potential graduates. Comparisons of the retention figures were made for each of the given time periods and for the projected "potential graduates" by means of a Chi-Square, as follows: Coordinated SEEK vs. Noncoordinated SEEK, Coordinated SEEK vs. Non-SEEK, Noncoordinated SEEK vs. Non-SEEK, Coordinated SEEK vs. Total Noncoordinated (Noncoordinated SEEK and Non-SEEK), and SEEK vs. Non-SEEK. None of these comparisons was statistically significant.

Table VIII (p. 22) gives the retention figures for Coordinated SEEK students grouped according to their skills levels (remedial course placements) on entry into college. These groups are: Level I, Mixed Level and Level II. The Level II group combines MAPES, SNAP and Regulars. The following Chi-Square comparisons were made: Level I vs. Mixed; Level I vs. Level II and Mixed vs. Level II. Students starting at Level I have the lowest retention rate at each point of time examined. The Mixed Level students have the highest level of retention for the first and second years. In fact, by the second year, their retention rate is significantly better than that of the Level I students. By the end of the fourth year, there is a more direct relation between retention and entry level academic skills. The stronger a student's skills on entry, the more likely that student is to still be in school at the end of the fourth year, and the more likely he or she is to graduate successfully. However, only the comparisons between Level I and Level II, the highest and lowest points on the continuum, are significant.

Table IX (p. 24) compares the retention rates for different sub-groups of the Level II Coordinated students: Regulars, MAPES and SNAP. Students in both the MAPES and SNAP groups show very high retention rates. At most points they do significantly better than the Regulars. Furthermore, their retention rate is higher at each point than the comparable retention rate for the Non-SEEK students (see Table III), although not significantly so. Some of these SNAP and MAPES students, however, are having academic problems, as reflected in their low GPAs, so that the "potential graduates" in these two groups are just about equal to the Non-SEEK group and are not significantly higher than the Regulars.

Among Coordinated SEEK students, the stronger the student's skills on entry to college, the more likely the student was to be in school at the end of four years and the better the student's chances of graduating successfully. Thus, the students who placed in all Level II remedial courses were more likely to be successful than the students who had Mixed placements, or the students who placed in all Level I courses. The potential graduation rates for these three groups were 31 percent, 25 percent

TABLE VII

COMPARISON OF RETENTION RATES FOR COORDINATED SEEK, NONCOORDINATED SEEK AND NON-SEEK STUDENTS(1)

Outcome	Group					
	Coordinated SEEK (N=192)		Noncoordinated SEEK (N=68)		Non-SEEK (N=50)	
	#	%	#	%	#	%
Completed 1 Year						
Yes	164	85%	56	85%	47	94%
No	28	15%	12	18%	3	6%
Completed 2 Years						
Yes	113	59%	42	62%	32	64%
No	79	41%	26	38%	18	36%
In School 6/84 (4th Year)						
Yes, GPA above 2	32	17%	14	20%	15	30%
Yes, GPA 1.9-2	12	6%	4	6%	2	4%
Yes, GPA below 1.9	17	9%	2	3%	2	4%
Total	61	32%	20	29%	19	38%
No, GPA above 2	20	10%	9	13%	10	20%
No, GPA abcve 1.9-2	12	6%	1	1%	0	0%
No, GPA below 1.9	95	50%	38	56%	21	42%
N.A.	4	2%	—	—	—	—
Total	131	68%	48	70%	31	62%
Potential graduates (Still attending, GPA 1.9 or better)	44	23%	18	26%	17	34%

(1)None of the differences are statistically significant.

TABLE VIII

COMPARISON OF RETENTION RATES FOR COORDINATED SEEK GROUPS AT DIFFERENT SKILLS LEVELS ON ENTRY INTO THE COLLEGE(1)

Outcome	Group					
	Level I N=85		Mixed N=20		Level II N=87	
	#	%	#	%	#	%
Completed 1 Year						
Yes	68	80%	19	95%	75	88%
No	17	20%	1	5%	10	12%
Completed 2 Years						
Yes	43	51%	15	75%	55	65%
No	42	49%	5	25%	30	35%
In School 6/84 (4th Year)						
Yes, GPA above 2	9	11%	4	20%	19	22%
Yes, GPA 1.9-2	4	5%	1	5%	7	8%
Yes, GPA below 1.9	6	7%	1	5%	10	12%
Total	19	23%	6	30%	36	42%
No, GPA above 2	14	16%	0	0%	6	7%
No, GPA above 1.9-2	7	8%	2	10%	3	4%
No, GPA below 1.9	43	51%	12	60%	40	47%
N.A.	2	2%	—	—	—	—
Total	66	77%	14	70%	49	58%
Potential Graduates	13	15%	5	25%	26	31%

(1)The following differences are statistically significant

(a) After 2 years - Level I vs. Mixed: $X^2 = 3.90$, $p < .05$
(b) After 6/84 - Level I vs. Level II: $X^2 = 8.04$, $p < .01$
(c) Potential Graduates - Level I vs. Level II: $X^2 = 5.62$, $p < .02$

and 15 percent, respectively. (See Table VIII.) However, within the Level II coordinated groups (where entry skills are similar) the MAPES and SNAP students showed significantly higher retention and potential graduation rates than the regular Level II students.

The persistence of the MAPES and SNAP students is especially noteworthy when compared to similar data for the Non-SEEK students. At the end of four years, 48 percent of MAPES students and 49 percent of SNAP students are still in school (Table IX) compared to only 38 percent of the Non-SEEK students (Table VII). However, more of the MAPES and SNAP students who are still in school are encountering academic problems and therefore have GPAs below 2.0. Thus the expected graduation rates for the MAPES and SNAP students are the same as the rates for the Non-SEEK students, not greater.

Additional information about retention was provided by calculating the average number of semesters completed by the members of each group, as of the end of the four year period of this study. These figure are: Level I - 5.08, Mixed - 5.10, Level II-Regular - 3.23, Level II - SNAP 5.77, Level II - MAPES - 5.80, Noncoordinated SEEK - 4.57, and Non-SEEK - 4.98. Except for the Level II-Regulars, the students in coordinated programs, especially those in SNAP and MAPES, are somewhat more persistent than the Noncoordinated SEEK students and the Non-SEEK students.

Discussion

According to this study, Coordinated SEEK programs as a group are no more effective than Noncoordinated SEEK programs in improving the academic performance of remedial students as reflected in their grades, rate of passing courses, accumulation of college credits, or retention. There is some indication in the results, however, that specific types of Coordinated programs, i.e. MAPES and SNAP, achieve higher retention and potential graduation rates than other types, i.e. Level II Regular. Finally, it appears that even though academic performance and skills prior to college strongly influence performance in college for all of the students in this study, being in SEEK mitigates these influences in the areas of retention and potential graduation.

Given the finding that differences in the academic performance of Coordinated and Noncoordinated students could not be attributed to program participation, it seems important to reconsider the way in which our coordinated program is structured. The original model for coordinated programming required that instructors and counselors not only plan curricula together and consult about students, but also that they attend each other's classes as a way of enhancing the team teaching, and that they have periodic joint conferences with students to assess the latter's needs, strengths and progress and provide useful feedback and advice to the students. In practice, some of these strategies have not been followed, because, among other reasons, the time commitments have been impractical. But maybe in making this choice, we have sacrificed some of the most critical elements of an effective program. In addition, one might look at the fact that, as now practiced, the coordinated programming is followed for only the first semester of a student's college attendance. Perhaps this is simply not enough time for the benefits of such programming to be effective. What would happen if coordinated programming, especially in remedial courses, would be extended to a full year? The present study does not address these alternatives. Maybe they would alter our findings and make us more effective, but maybe not.

TABLE IX

COMPARISON OF RETENTION RATES FOR THE SUBGROUPS OF LEVEL II COORDINATED STUDENTS(1)

Outcome	Group					
	Level II Regular (N=21)		Level II MAPES (N=27)		Level II SNAP (N=39)	
	#	%	#	%	#	%
Completed 1 Year						
Yes	16	76%	26	96%	35	90%
No	5	24%	1	4%	4	10%
Completed 2 Years						
Yes	7	33%	18	67%	30	77%
No	14	67%	9	33%	9	23%
In School 6/84 (4th Year)						
Yes, GPA above 2	3	14%	4	15%	12	31%
Yes, GPA 1.9-2	0	0%	6	22%	1	3%
Yes, GPA below 1.9	1	5%	3	11%	6	15%
Total	4	19%	13	48%	19	49%
No, GPA above 2	1	5%	1	4%	4	10%
No, GPA above 1.9-2	0	0%	1	4%	2	5%
No, GPA below 1.9	14	67%	12	44%	14	36%
N.A.	2	10%	—	—	—	—
Total	17	82%	14	52%	20	51%
Potential Graduates	3	14%	10	37%	13	34%

(1)The following differences are statistically significant

(a) After 1 year - Regular II vs. MAPES: $X^2 = 4.37$, $p < .05$

(b) After 2 years - Regular II vs. MAPES: $X^2 = 5.26$, $p < .03$

Regular II vs. SNAP: $X^2 = 10.97$, $p < .001$

Regular II vs. MAPES & SNAP: $X^2 = 10.63$, $p < .01$

(c) After 6/84 - Regular II vs. SNAP: $X^2 = 4.09$, $p < .05$

Regular II vs. MAPES & SNAP: $X^2 = 4.55$, $p < .05$

In the context of these questions about the structure of the Coordinated Skills programs, it seems relevant to consider the reasons why the MAPES and SNAP programs appear to work better than the other coordinated programs including the Regular Level II program. MAPES and SNAP were similar to each other, but different from the other groups in one very important way: skills instruction was accomplished using materials related to the students' career goals, nursing for SNAP students, and science and technology for the MAPES students. The use of this common content might have meant that these groups were somewhat more coordinated since the content selection made joint curriculum planning essential. Furthermore, the use of this common material meant that certain ideas or concepts were repeated in different contexts and thereby reinforced and strengthened. Possibly too, the fact that the material was related to their stated career goals may have helped the students to understand more clearly what those goals were about, and may have also conveyed to them that those goals were being considered very seriously, as genuine possibilities to be pursued. One might expect such a message to have enhanced and strengthened their motivation. But, although we can speculate about alternative structures for our coordinated programming which might improve students' academic performance, the present study does not address these alternatives. Maybe they would make us more effective, but maybe not. We need to keep in mind the possibilities that the beneficial value of coordinated programming may be more limited than we had expected and that we need to look elsewhere for additional solutions to the problem of how best to help our student. Furthermore, with the example of the SNAP and MAPES programs discussed above, we must also keep in mind that these students entered college with stronger skills than the other SEEK students, even the Level II Regular students (Table II).

In the present sample, success in college is on the whole related to prior academic performance in High School and to the level of one's basic skills in reading and writing at the time of admission to college. This finding is reinforced by the related finding that retention and potential graduation among Coordinated SEEK students improves as entry level test scores increase. The connection between the skills a student brings with him to college and his eventual chances of success would lead us to expect greater retention and potential graduation rates for the Non-SEEK students than for the SEEK students. However, although Non-SEEK students begin college with academic and skills advantages and fare better academically while in college, they are not necessarily any more likely to remain in school or to complete their studies to graduation than SEEK students. Apparently SEEK has been able to improve the chances for success of the initially weaker students whom it admits And, since all the subjects in this study (SEEK and Non-SEEK) had the benefit of academic remediation, this finding of the improved position of the SEEK students confirms the importance of the total package of support services available through SEEK, notably the availability of counseling and tutoring.

In fact, some of the evidence presented suggested that the Non-SEEK students drop out of school more readily than the SEEK students. They spend slightly fewer semesters at school even though they are only slightly more likely to leave in good standing. Apparently SEEK students, especially the stronger ones (i.e., MAPES and SNAP), appear to persist longer even when they are encountering difficulty. In view of an earlier study which found that MAPES students had an increased chance of graduating successfully, although not necessarily as Science or Engineering majors, the present study might be interpreted to mean that, along with the encouragement to persevere, the SEEK students are helped by the encouragement to be flexible about the goals they are pursuing, when necessary, and by career counseling with information about alternative goals. A more extensive study relating persistence to goal flexibility might be of value in illuminating the conditions under which these students drop out.

One additional finding serves as a further indicator that the SEEK program as a whole modifies the influence of prior performance and skills. Although prior skills contributed significantly to college academic performance through the fourth year when Non-SEEK students were included in the

analysis, those skills measures are no longer significant determinants of success when only SEEK students are included. In part, this may be because the strongest SEEK students (MAPES and SNAP) are majoring in scientific fields and are therefore taking the most difficult courses and encountering academic problems. But, other variables such as personal, social, and environmental factors may also be exerting an influence.

Some of the questions raised by this study could be answered by an additional analysis of the present data and others will require further data collection. The present analyses indicate that coordinated programs as a group are no more effective than noncoordinated programs, but they do not compare any individual coordinated program to the noncoordinated program. Since there is some evidence that MAPES and SNAP are more effective than other coordinated programs serving students of similar skill levels, it is possible that some individual coordinated programs have a greater impact than noncoordinated programs. Additional statistical analyses of the present data could answer that question. It would also be useful to gather data on other issues such as economic and social factors which might influence student performance. These two sets of additional information could suggest new types of support programs to improve the retention and performance of SEEK students.

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