

A Comparison of Transfer and Nontransfer Agriculture and Home Economics Undergraduate Students: Academic Aptitude, Achievement, and Degree Persistence

Donald M. Johnson, Assistant Professor
Mississippi State University

Community colleges play a major role in the American system of higher education. During the fall 1985 semester, 43% of undergraduate students were enrolled in two-year institutions. Fifty-one percent of first-time college freshman were enrolled in public or private community colleges (El-Khawas, Carter, and Ottinger, 1988).

Students enroll in community colleges to fulfill a variety of goals. According to Banks (1990, p. 53), "In any given state, community colleges offer vocational training, remedial education, adult and continuing education, as well as a starting point from which many students can continue on to four-year colleges and universities."

Despite the diversity of goals, transfer education remains central to the community college mission. Brawer (1991) indicated that 22% of students completing 12 or more semester credit hours at a community college eventually enroll for courses at a four-year college or university. In addition, 42% of public community college graduates continue their education at four-year institutions (El-Khawas, et al., 1988).

Mississippi has a well-established system of 15 public community college districts offering on-campus instruction at 36 locations throughout the state. These community colleges enrolled slightly over 55,000 students during the fall 1987 semester. Approximately 45% of these students were in programs designed for transfer to four-year colleges or universities (Molpus, 1989).

Community college transfer students comprise a significant portion of the total undergraduate enrollment in the College of Agriculture and Home Economics (CAHE) at Mississippi State University (MSU). According to MSU's Office of Institutional Research, 33.5% of undergraduate students enrolled in the CAHE during the fall 1989 semester were community college transfers.

Several researchers have found that significant differences exist between students beginning their college careers in two-year institutions and those initially enrolling in four-year institutions. Two-year college students are more likely to be first-generation college students (Willett, 1989) and are more likely to come from families of lower socioeconomic status (Cohen & Brawer, 1982; El-Khawas, et al., 1988). Two-year college students are also more likely to have achieved lower high school class rank (El-Khawas, et al., 1988) and to have scored lower on college entrance examinations (Anderson, 1977; Cohen & Brawer, 1982; Grimes & Hausenfluck, 1980) than students initially enrolling in four-year institutions.

Once enrolled in a senior college, community college transfer students tend to not perform as well as students who begin their studies at four-year institutions. Anderson (1977) and Holahan, Green and Kelly (1983) found that transfer students achieved significantly lower cumulative quality point averages (QPAs) than nontransfer students. In addition, community college transfer students are less likely to complete a baccalaureate degree than are nontransfer students (Cohen & Brawer, 1982). Finally, Menke (1980) found that two-year college transfer students earning an undergraduate

degree require a significantly longer period of time to do so than students initially enrolling at the degree granting institution.

Problem Statement

Community college transfer students account for approximately one-third of the undergraduate enrollment in the College of Agriculture and Home Economics at Mississippi State University. In addition, community college transfer students differ from nontransfer students in academic aptitude, achievement, and degree persistence (Anderson, 1977; Cohen & Brawer, 1982; El-Khawas, et al., 1988, Holahan, et al., 1983).

Knowledge about the academic aptitude, achievement, and degree persistence of transfer and nontransfer students in the CAHE at MSU is not currently available. Research is needed to address this void. Such research is needed to provide information necessary to effectively advise CAHE students transferring from two-year institutions. In addition, information gained from this study is needed to determine if increased efforts can be legitimately targeted toward recruitment of community college transfer students into agriculture and home economics majors at MSU.

Purpose and Hypotheses

The primary purpose of this study was to compare community college transfer students and nontransfer students in the CAHE at MSU to determine if significant differences existed between the two groups on measures of academic aptitude, achievement, and degree persistence. A secondary purpose was to determine if differences existed between majors (agriculture or home economics) in the College. The following null hypotheses were formulated and tested at the .05 alpha level.

When considering composite ACT scores and cumulative QPAs, there is no difference in group means for CAHE undergraduates classified as either transfer or nontransfer students or as agriculture or home economics majors.

When considering undergraduate degree persistence, the status of CAHE undergraduates is independent of student classification as either a transfer or nontransfer student or as an agriculture or home economics major.

Procedures

This study employed the ex post facto (static group comparison) research design as described by Campbell and Stanley (1966).

The population of transfer students was composed of all undergraduate CAHE students initially enrolling at MSU on a full-time basis (12 or more semester hours) for the fall 1987 semester who had completed 12 or more semester hours at a regionally accredited community college. The population of transfer students (N=82) included 60 agriculture majors and 22 home economics majors.

The population of nontransfer students was comprised of all MSU undergraduate students in the CAHE during the fall 1987 semester who had initially enrolled at MSU as a full-time student (12 or more semester hours) for the fall 1985 semester and had met MSU requirements for classification as a new freshman (i.e. first enrollment at MSU and fewer than 132 semester hours of transfer credit). The population of nontransfer students (N=103) included 60 agriculture majors and 43 home economics majors.

The data reported in this study were obtained by the MSU Office of Institutional Research from computerized official university student records. Data compiled for each subject included classification as a transfer or nontransfer student; major (agriculture or home economics); composite ACT score; transfer quality point average (QPA) where applicable; cumulative QPA; Fall 1987 academic classification; and Fall 1989 MSU undergraduate status (i.e. graduated, enrolled, or other).

The data were analyzed using descriptive, nonparametric, and inferential statistics. The use of inferential statistics was based on the assumption that the students included in this study were representative of past, present, and future undergraduate CAHE students at MSU. According to Oliver and Hinkle (1982, p. 200), "Such an assumption permits the use of inferential statistics and, if made, must be defended by the researcher as being reasonable."

Based on a review of longitudinal studies (Bowen & Lee, 1985; Taylor, 1989) of undergraduate MSU agriculture students, the researchers felt this assumption was warranted. According to Taylor (1989, p. 19), "There appear to be no significant changes in students enrolled in agriculture majors over the ten year period of study, 1977 to 1987, in regards to the variables investigated."

Data for the first hypothesis were analyzed using two-way multiple analysis of variance (MANOVA) followed by univariate analysis of variance (ANOVA) (Baker & Baker, 1984). Data for the second hypothesis were analyzed using log-linear analysis (Knoke & Burke, 1980).

Limitations

One potential problem in ex post facto research is a lack of precision in defining group membership (Borg & Gall, 1983). This limitation is acknowledged for the present study. Information concerning the year in which transfer students initially enrolled in community colleges was not available through MSU's Office of Institutional Research. The possibility exists that not all transfer students began college in fall 1985.

In an attempt to compensate for this limitation, the transfer and nontransfer groups were compared on the related variable of Fall 1987 academic classification. Chi-square analysis indicated that there was no significant difference ($p > .05$) between the percentage of underclass and upperclass' students in the two groups ($X^2=3.49$, $df=1$). It can be reasonably assumed that the potential problem of group definition is not a serious limiting factor in this study.

Finally, since this study employed the ex post facto research design, results are limited to describing differences between groups. No assumptions of causality should be made (Campbell and Stanley, 1966; McCracken, 1991).

Results

Of the 185 students included in the study, 82 (44.3%) were community college transfers while the remaining 103 (55.7%) were nontransfer students. Table 1 contains descriptive statistics for composite ACT scores and cumulative QPAs, both overall and by student category.

Table 1. Composite ACT Score and Cumulative QPA by Student Category

Category	Composite ACT Score			Cumulative QPA		
	N	Mean	S.D.	N*	Mean	S.D.
Group						
Transfer	82	16.57	4.72	79	2.57	.59
Nontransfer	103	19.38	4.23	97	2.65	.63
Major						
Agriculture	120	18.81	4.99	113	2.58	.63
Home Economics	65	16.89	3.69	63	2.67	.58
Group x Major						
Transfer x Agriculture	60	17.08	5.04	58	2.57	.58
Nontransfer x Agriculture	60	20.53	4.32	55	2.60	.68
Transfer x Home Economics	22	15.18	3.40	21	2.58	.63
Nontransfer x Home Economics	43	17.77	3.55	42	2.71	.56
Total	185	18.14	4.65	176	2.61	.61

*Note. Nine students had missing values for cumulative QPA.

A two-way MANOVA was used as a preliminary test of the first hypothesis. The results of this test are presented in Table 2.

Table 2. MANOVA for Differences Between Group, Major, and Group x Major on Composite ACT Score and Cumulative QPA

Effect	Hotelling-Lawley Trace	df	F	p
Group (Transfer or Nontransfer)	0.1337	2171	11.43	.0001
Major (Agriculture or Home Economics)	0.1095	2171	9.37	.0001
Group x Major	0.0082	2171	0.70	.4983

Examination of Table 2 indicates that significant differences existed within Group and within Major for one or both of the dependent variables. There was no significant interaction effect between Group and Major for either of the dependent variables. Based on the MANOVA results, H_{01} was rejected.

Since the MANOVA results indicated that both main effects (Group and Major) were significant, ANOVA procedures were used on each dependent variable to identify the variable(s) contributing to the rejection of the null hypothesis. These results are presented in Table 3.

Table 3. ANOVA for Main Effects on Composite ACT and Cumulative QPA

Effect	ANOVA Results					
	Composite ACT			Cumulative QPA		
	df	F	p	df	F	p
Group (Transfer or Nontransfer)	1175	20.88	.0001	1175	0.64	.4259
Major (Agriculture or Home Economics)	1175	12.43	.0005	1175	0.41	.6134

The ANOVA results indicated significant differences existed between transfer and nontransfer students and between agriculture and home economics majors on the dependent

variable of composite ACT score. Analysis of mean values (Table 1) reveal that nontransfer students had a higher mean composite ACT score than transfer students. Likewise, agriculture majors had a higher mean composite ACT score than home economics majors. There were no differences between transfer and nontransfer students or between agriculture and home economics majors on the dependent variable of cumulative QPA.

The results of log-linear analysis (Table 4) indicated that a significant relationship existed between Group classification and undergraduate degree persistence. No significant relationship existed between undergraduate degree persistence and Major. Finally, there was no significant interaction effect of Group and Major on undergraduate degree persistence. Based on these findings, H_{02} was rejected.

Table 4. Relationship of Group, Major, and Group x Major with Undergraduate Degree Status

Source	df	Chi-square	p
Group (Transfer or Nontransfer)	2	9.33	.0094
Major (Agriculture or Home Economics)	2	0.82	.6642
Group x Major	2	0.62	.7318

Data in Table 5 indicate that a higher percentage of nontransfer students had completed undergraduate degrees than had transfer students. Transfer students comprised a higher percentage of students in both the "enrolled" and "other" categories than did nontransfer students.

Table 5. Fall 1989 Undergraduate Status for Transfer and Nontransfer Students

Group	Undergraduate Status					
	Graduated		Enrolled		Other	
	N	%	N	%	N	%
Transfer	35	42.7	22	26.8	25	30.5
Nontransfer	69	67.0	17	16.5	17	16.5

Discussion

The finding that transfer students have a lower level of academic aptitude (as measured by composite ACT score) than nontransfer students is consistent with previous research (Anderson, 1977; Cohen & Brawer, 1982; Grimes & Hausenfluck, 1980). Community college and university entrance requirements may contribute to this situation. According to Cross (in Cohen & Brawer, 1982):

The groups new to higher education. . . will be those with low socioeconomic status and those with low measured ability. The movement is already underway; the majority of students entering open-door community colleges come from the lower half of the high school classes . . . (p. 36)

Based on composite ACT score requirements in effect for Fall 1985, 39% (32 of 82) of the transfer students were not eligible for admission to MSU as freshmen. This supports the contention by Cohen and Brawer (1982, p. 48) that, "In states where public institutions of higher education are arrayed in hierarchical systems, most of the students

begin in community college and the proportion of lower-ability students is greatest in such colleges."

The results of this study indicated that agriculture majors had a higher level of academic aptitude (as measured by composite ACT score) than home economics majors. Although beyond the scope of this study to identify factors related to this situation, a partial answer may lie in the gender composition of the two groups. According to data reported in MSU's 1989-1990 response to the Food and Agricultural Education Information System (FAEIS) questionnaire, females accounted for 91.35% of the total undergraduate enrollment in home economics, while males accounted for 79% of the total undergraduate agriculture enrollment. Previous research (American College Testing Program, 1990; Doolittle, 1987; Sawyer, 1985) has indicated that males tend to achieve higher composite ACT scores than females.

There was no interaction effect between Group and Major on the dependent variable of composite ACT score. Nontransfer agriculture majors had the highest mean composite ACT score; transfer home economics majors had the lowest mean score.

There were no significant differences within Group or within Major on the dependent variable of cumulative QPA. In addition, there was no significant interaction effect between Group and Major on the dependent variable of cumulative QPA. This finding supports previous researchers (Cole & Bokor, 1989; Rudolph & Yoder, 1987) who have suggested that nonacademic factors, such as personal aspirations, play a major role in determining academic achievement in postsecondary education.

Nontransfer students were more likely to either receive an undergraduate degree or maintain enrollment in the CAHE at MSU than were transfer students. This finding is consistent with previous research concerning the persistence of transfer and nontransfer students (Cohen & Brawer, 1982).

No differences existed between the degree persistence of agriculture majors and home economics majors. Finally, there was no significant interaction between Group and Major on the variable of degree persistence.

Implications

The findings of this study have important implications for recruiting and advising undergraduate CAHE students at MSU. Although transfer students tend to have lower composite ACT scores, they achieve cumulative QPAs equal to those earned by nontransfer students. This indicates that recruitment of transfer students into agriculture and home economics majors at MSU is a legitimate method of maintaining and/or increasing undergraduate enrollment.

Community college transfer students are less likely than nontransfer students to complete an undergraduate degree in the CAHE at MSU. Increased retention efforts targeted toward this group are warranted. In fact, one could question the ethics of increased recruitment efforts without corresponding increases in programs designed to enhance degree completion.

References

- American College Testing Program. (1990). The high school profile report. Iowa City, IA: Author.
- Anderson, E. P. (1977). Three year comparison of transfer and native student progress at the University of Illinois at Urbana-Champaign, fall 1973 group. (Research

Memorandum 77-9). Urbana: University of Illinois, University Office of School and College Relations. (ERIC Document Reproduction Service No. ED 149 820).

- Baker, H. R. & Baker, B. M. (1984). Multivariate analysis of variance (MANOVA): A practical guide to its use in scientific decision making. University, AL: The University of Alabama Press.
- Banks, D. L. (1990). ERIC review: Why a consistent definition of transfer? Community College Review, 18(2), 47-53.
- Bowen, B. E. & Lee, J. S. (1985). Educational and occupational aspirations of students in agriculture majors. The Journal of the American Association of Teacher Educators in Agriculture, 25(2), 23-29.
- Brawer, F. B. (1991). The transfer issue; Definitions and data. Community/Junior College: Quarterly of Research and Practice, 15(2), 135-139.
- Campbell, D. T. & Stanley, J. C. (1966). Experimental and quasi-experimental designs for research. Chicago, IL: Rand McNally Publishing.
- Cohen, A. M. & Brawer, F. B. (1982). The American community college. San Francisco, CA: Jossey-Bass Publishers.
- Cole, R. L. & Bokor, D. A. (1989). High school vocational agriculture and success in college. NACTA Journal, 33(1), 10-13.
- Doolittle, A. E. (1987). Gender differences in performance on mathematics achievement items. Iowa City, IA: American College Testing Program.
- El-Khawas, E., Carter, D. J. & Ottinger, C. A. (1988). Community college fact book. New York: Macmillan Publishing Company.
- Grimes, J. P. & Hausenfluck, T. (1980). Academic aptitude and performance of native and transfer undergraduates in the College of Agriculture, Texas A&M University. Proceedings of the 29th Annual Southern Agricultural Education Research Conference. Auburn, AL: Auburn University.
- Holahan, C. K, Green, J. L. & Kelly, H. P. (1983). A 6-year longitudinal analysis of transfer student performance and retention. Journal of College Student Personnel, 24, 305-210.
- Knoke, D. & Burke, D. J. (1980). Log-linear models. Beverly Hills, CA: SAGE Publications.
- McCracken, J. D. (1991). The use of and misuses of correlational and regression analysis in agricultural education research. Proceedings of the 18th Annual National Agricultural Education Research Meeting, Los Angeles, CA.
- Menke, D. H. (1980). A comparison of transfer and native bachelor's degree recipients at UCLA, 1976-1978. Unpublished doctoral dissertation, University of California at Los Angeles.
- Molpus, D. (1989). Mississippi official and statistical register, 1988-1992. Jackson, MS: Office of the Secretary of State.

- Oliver, J. D. & Hinkel, D. E. (1982). Occupational education research: Selecting statistical procedures. Journal of Studies in Technical Careers, 9, 199-207.
- Rudolph, J. L. & Yoder, E. P. (1987). The effect of participation in secondary vocational agriculture on success in postsecondary education. Proceedings of the 14th Annual National Agricultural Education Research Meeting, Orlando, FL.
- Sawyer, R. (1985) Using demographic information in predicting college freshman grades. Iowa City, IS: American College Testing Program.
- Taylor, W. M. (1989). Longitudinal study of undergraduate agriculture majors: 1977, 1982, and 1987: Mississippi State: Mississippi State University.
- Willett, L. H. (1989). Are two-year college students first-generation college students? Community College Review, 17(2), 48-52.