

**EDUCATIONAL NEEDS OF INTERNATIONAL GRADUATE STUDENTS
IN AGRICULTURE AND EDUCATION AS PERCEIVED BY
UNIVERSITY OF MISSOURI-COLUMBIA GRADUATE FACULTY**

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Experiences traditionally described at universities as being educational—such as those related to curriculum, research, and academic advisement—are only part of the overall physical, cultural, and psychological adjustment required of international students who complete a graduate program in the United States. Any attempt to place a relative value on particular aspects of this adjustment process would be difficult to support. However, learning and academic performance—the subsequent results of educational experiences—remain the standards by which the success of international graduate students is measured. The value of educational experiences in the adjustment process facing these students, therefore, should not be underestimated. At U.S. land-grant universities, it is becoming increasingly common for graduate faculty members to be involved with the academic performance and progress of international graduate students; graduate faculty members establish professional, working relationships with these students and are often involved in the development of educational activities for meeting their needs. Graduate faculty members are thus able to contribute to and assume responsibility, in part, for the graduate education and professional preparation of international graduate students. Although graduate faculty members are regularly challenged to translate their perceptions of educational needs of international graduate students into appropriate educational activities, identifying and describing these needs remains a problem.

In the decades following the end of World War II, the number of international students enrolling in U.S. colleges and universities has steadily increased. Nearly one-third (32%) of the international students studying throughout the world in 1986/87 were at U.S. colleges and universities (Zikopoulos, 1986). A recent trend toward graduate study among international students in the United States warrants attention. During the 1986/87 school year, the proportion of international students pursuing graduate degrees in the United States rose above that of international students pursuing bachelor's degrees for the first time in two decades (Zikopoulos, 1986). During the 1986/87 school year, the most significant trend in academic level of international students was the increasing proportion in graduate study (Zikopoulos, 1987). The proportion of graduate students in the international student population continued to increase into the 1988/89 school year, to 165,380 or 45% of the total, an increase of 6% over the previous year (Zikopoulos, 1988). At the same time, the proportion of international students at the bachelor's level decreased by 4% to 131,300 or 36% of the total.

Both international student and faculty perceptions of the needs of international students were examined by Mibey (1984), Mtebe (1985), and Omar (1985). Mibey recommended exploring the potential value of having international students in Agriculture give a statement of their career objectives to their instructors. A major problem of international students, according to Mtebe, was gaining work experience related to their degree program before returning home. Omar found use of the English language, social and personal difficulties, and financial difficulties were perceived by faculty members as being the major problem areas of international students; international students, however, indicated that their major problem areas were finances, placement (related to finances), use of the English language, and academic difficulties. Problems of a social and personal nature were not major concerns of international students,

Extensive information regarding educational needs of international students, based on the students' responses, was found in a study by Lee, Abd-Ella, and Burks (1981). When Engineering, Agriculture, Natural and Life Sciences, Social Sciences, and Other were used to represent major fields of study, Lee et al. found significant differences among the areas in international students' perceptions regarding the importance of 10 of 23 need composites and the satisfaction of 3 of 23 need composites. International students in Agriculture stood out in composite scores representing the importance of needs for academic planning, relevancy of education, and training to apply knowledge. They also perceived that their needs were more satisfied than those of students in Social Sciences.

Several studies focused on international students' perceptions of their needs in general. Ming-Chu (1983) concluded that international graduate students "survived" their academic programs by using

approaches which were different than those used by their U.S. counterparts. Improved communication was the institutional need assigned highest priority by international graduate students in a study by Shodavaram (1983). Ahmadian (1983) found that international students perceived the writing of term papers and participating in classroom discussions to be among their areas of greatest academic difficulty. In a survey of international students, Quirino and Ramagen (1985) identified language proficiency, cultural adaptation, and academic orientation as being among the difficulties experienced by the students. Lanz's (1985) survey of international graduate students in Education revealed that library use and understanding lectures and textbooks were perceived as being the most important factors which influenced their academic adjustment.

Faculty perceptions of international student needs were the focus of several other studies. Kadi (1976) found that some of international students' most common problems, as perceived by college faculty members, were difficulties with the English language and differences in cultural/social norms. Academic advisors indicated that they had specific needs related to advising international graduate students (Greisberger, 1985). They needed more information regarding their international advisees and orientation sessions regarding the advisement of international students. Wakim (1985) found that international graduate students who were studying Education emphasized the importance of the academic advisor's role in an overall academic experience. Khabiri (1985) found that academic advisors perceived they had a problem communicating with international graduate students. Miri-Shaibani (1986) found that international students' three most important problem areas, as perceived by international student advisors, were finances, use of the English language, and understanding immigration policies.

As is commonly the case with graduate faculty members at universities in the United States, part of the responsibility of graduate faculty members at the University of Missouri-Columbia (UMC) is to design graduate programs to meet both societal needs and the career and intellectual objectives of students. Although increases in international graduate student enrollment have been substantial (UMC, 1989/1990), inquiry into the area of educational needs of international graduate students at the UMC Colleges of Agriculture and Education was limited. Examining these needs from the perspective of graduate faculty members was considered a means of broadening the available data base regarding educational areas in Agriculture and Education which are especially critical in the academic programs of international graduate students.

Purpose and Objectives

The purpose of this study was to assess the importance and the satisfaction of selected educational needs of international graduate students as perceived by graduate faculty members in the UMC Colleges of Agriculture and Education. Differences in perceptions of subsets of curricular, research, and academic advisement needs of international graduate students between the Colleges were investigated. Characteristics which influenced the perceptions were analyzed. Related comparisons of perceptions of the individual needs were made between the Colleges, and additional international graduate student needs were identified.

The research objectives of this study were to:

1. Assess the importance and the satisfaction of selected curricular, research, and academic advisement needs of international graduate students as perceived by the UMC Agriculture and Education graduate faculties.
2. Ascertain if differences existed between the perceptions held by the UMC Agriculture and Education graduate faculties regarding the importance of selected curricular, research, and academic advisement needs of international graduate students.
3. Ascertain if differences existed between the perceptions held by the UMC Agriculture and Education graduate faculties regarding the satisfaction of selected curricular, research, and academic advisement needs of international graduate students.

Procedures

This study used an ex post facto design. The independent variable was college type. The dependent variable was college type. The dependent variables were measures of the respondents' perceptions of three subsets of items on the questionnaire. Degree of involvement with international graduate students and duration of international experience were the covariates. Null hypotheses were

formulated to test research objectives two and three; related alternate hypotheses were formulated to be tested if the assumptions of covariance (homogeneity of slopes) were met.

The population for this study consisted of the 278 graduate faculty members in the UMC College of Agriculture and 100 graduate faculty members in the UMC College of Education during the 1989 fall semester. A random sample stratified by college was used for the study. The sample of 162 graduate faculty members in Agriculture and 80 graduate faculty members in Education was drawn from lists provided by the UMC graduate school. The judgement was made to draw a sample in order to allow the use of detailed follow-up procedures and thus increase response rates for the study. Sample size was calculated using the Krejcie and Morgan (1970) formula.

The survey instrument for this study was developed from a review of literature. Several questionnaire items used in this study were based on items from selected sections of the questionnaire developed by Lee, Abd-Ella, and Burks (1981). A panel of experts in Agriculture and Education in Missouri validated the content of the instrument. Following a pilot test, minor changes in word selection were made in the instrument cover letter and questionnaire.

The questionnaire had three sections. In section I, graduate faculty members were asked to provide demographic information related to their involvement with international graduate students and their international experience. In section II, graduate faculty members were asked to use Likert-type scales to indicate their perceptions of the levels of importance and satisfaction of the 23 items. Each item represented an international graduate student need related to either curriculum, research, or academic advisement. There were three subsets of items. Subset one contained 7 curricular items, subset two contained 10 research items, and subset three contained 6 academic advisement items. Section III provided graduate faculty members with spaces to record additional international graduate student needs. The recorded needs were summarized according to the predominant themes which occurred among the responses from each College.

A cover letter, questionnaire, and return envelope were mailed to randomly selected graduate faculty members. After ten working days, a follow-up letter, duplicate questionnaire, and return envelope were mailed to nonrespondents on campus. Those who did not respond to the follow-up procedures within ten working days were contacted to encourage their participation. In Agriculture, 114 of a possible 162 graduate faculty members responded to the questionnaire with usable responses (70% response rate). In Education, 52 of possible 80 graduate faculty members responded (65% response rate). Chronbach's alpha was used to estimate item reliability. The reliability estimate for the items in regard to importance was .99 and in regard to satisfaction was .98.

Analysis of Data

Means and standard deviations were calculated for each item and for each subset of items on the questionnaire. Multivariate analysis of variance (MANOVA) followed by univariate analysis of variance (ANOVA) procedures were used to test for significance at the .05 alpha level. Hotelling-Lawley's Trace was used to ascertain significant differences in the MANOVA procedures. All analyses used the General Linear Model (GLM) described by the SAS Institute Inc. (1985).

Results

An analysis of differences between early and late responses revealed no significant differences in perceptions of either the importance or the satisfaction of the needs between the combined early and late respondents. However, the MANOVA for Education revealed a significant difference (Hotelling-Lawley Trace = .38, $F[3, 38] = 4.85$, $p > F = .0059$) in the perceived satisfaction of the needs between early and late respondents, and the ANOVA revealed a significant difference ($F = 6.59$, $p > F = .0138$) pertaining to academic advisement.

As illustrated in Table 1, the subsets of curricular and research needs were perceived as being most important in Agriculture, and the subset of curricular needs was perceived as being most important in Education. The curricular item, Increase their level of ability in speaking the English language was given the highest importance rating in Agriculture, while, Increase their level of ability in writing the English language and, Increase their level of ability in speaking the English language were given the highest importance ratings in Education. The research item, Become familiar with research journals in their professional area was given the highest importance rating in Agriculture and Education. Also in both Colleges, the academic advisement item, Complete a degree program which is relevant to their academic and professional goals was given the highest importance rating.

Table 1
Means of Respondent Perceptions of the Items Related to Educational Needs of International Graduate Students

Item	<u>M</u> ^a	<u>M</u>	<u>M</u>	<u>M</u>	
	<u>Importance</u>		<u>Satisfaction</u>		
	<u>Agri.</u>	<u>Educ.</u>	<u>Agri.</u>	<u>Educ.</u>	
<u>Curriculum</u>					
Work with other grad students as a team.	5.22	5.44	4.29	3.94	
Field trips away from campus.	4.82	4.98	3.86	3.63	
International dimension in courses.	4.80	4.94	3.90	3.98	
Writing the English language.	6.04	6.25	4.08	3.78	
Speaking the English language.	6.08	6.25	3.99	3.78	
Use software and microcomputers.	5.39	5.06	4.88	4.92	
Complete an internship.	4.47 ^{a,b}	5.02 ^a	3.88	3.67	
	—	—	—	—	
	Subset <u>M</u> =	5.32	5.41	4.13	3.99
<u>Research</u>					
Learn to apply for a research grant.	4.83 ^a	3.90 ^a	3.63	3.67	
Collect research data in home country.	3.91	4.13	3.90	3.90	
Learn to prepare a research proposal.	5.64	5.67	4.21 ^a	4.69 ^a	
Be familiar with research journals.	6.29	6.12	5.09	5.24	
Research based on home resources/tech.	4.49	4.38	3.97	4.13	
Write a research/journal article.	5.88 ^a	4.76 ^a	4.33 ^a	3.49 ^a	
Present their research in a seminar.	6.10 ^a	5.17 ^a	5.22 ^a	4.06 ^a	
Learn computer procedures for research.	5.90	5.56	5.09	4.69	
Attend research conferences.	5.81	5.42	4.92 ^a	3.76 ^a	
Collaborate on a research project.	4.41 ^a	4.96 ^a	4.12	3.69	
	—	—	—	—	
	Subset <u>M</u> =	5.32 ^a	5.00 ^a	4.42	4.19

Table 1 (continued next page)

Table 1 (continued)

Item	<u>M</u>		<u>M</u>		
	<u>Importance</u>		<u>Satisfaction</u>		
	<u>Agri.</u>	<u>Educ.</u>	<u>Agri.</u>	<u>Educ.</u>	
<u>Academic Advisement</u>					
Advisor with international experience.	4.25	4.06	4.34*	3.85*	
Responsibility in planning degree program.	5.92	5.90	4.82*	5.64*	
Clarify academic/professional goals.	5.81	6.00	4.26*	4.78*	
Degree program relevant to their goals.	6.16	6.19	4.86	5.27	
Maintain contact with advisor.	4.98*	4.40*	4.15	4.29	
Advisor experienced with intl grads.	4.54	4.54	4.52*	4.04*	
	—	—	—	—	
	Subset <u>M</u> =	5.28	5.18	4.48	4.67

Note. Questionnaire items are presented in a condensed version. Abbreviations used include: grad = graduate, tech = technology, intl grads = international graduate students.

^a Responses regarding importance were coded: 1 = very unimportant; 2 = quite unimportant; 3 = somewhat unimportant; 4 = neither important nor unimportant; 5 = somewhat important; 6 = quite important; 7 = very important. Responses regarding satisfaction were coded: 1 = very unsatisfied; 2 = quite unsatisfied; 3 = somewhat unsatisfied; 4 = neither satisfied nor unsatisfied; 5 = somewhat satisfied; 6 = quite satisfied; 7 = very satisfied.

^b * indicates significantly different means at the .05 level.

The subset of curricular needs was perceived as being least satisfied in Agriculture and Education (see Table 1). The curricular item, Go on course-related field trips away from campus was given the lowest satisfaction rating in both Colleges. Also in both Colleges, the research item, Learn to apply for a research grant was given the lowest satisfaction rating. The academic advisement item, Maintain professional contact with their academic advisor after graduating and returning home was given the lowest satisfaction rating in Agriculture, while, Be advised by an academic advisor who has professional experience working with international students was given the lowest satisfaction rating in Education.

A significant difference (Hotelling-Lawley Trace = .13, $F[3, 142] = 6.34$, $p > F = .0005$) was revealed between the College means of the perceived importance of the subsets of needs when considered simultaneously. As illustrated in Table 2, a significant difference using ANOVA ($F = 3.90$, $p > F = .0501$) was also found between the Colleges in the perceived importance of the subset of needs pertaining to research. The subset pertaining to research was perceived as being more important in Agriculture.

A significant difference (Hotelling-Lawley Trace = .09, $F[3, 127] = 3.75$, $p > F = .0128$) was revealed between the College means of the perceived satisfaction of the subsets of needs when considered simultaneously. However, no significant differences were found between the Colleges in the perceived satisfaction of the subsets of needs when examined individually by use of ANOVA procedures. Among the three subsets, the subset pertaining to research yielded the greatest difference ($F = 2.93$, $p > F = .0891$) in perceived satisfaction between the Colleges.

Tests for homogeneity slopes indicated that analysis of covariance procedures could not be used properly in this study to test the effects of the selected covariates, degree of involvement with international students and duration of international experience. In related comparisons of the

individual items by college type, 6 items were found to have produced significantly different responses in regard to the importance of the needs and 8 items were found to have produced significantly different responses in regard to the satisfaction of the needs (see Table 1). Communication skills, academic preparation, and advisor international experience were stressed in the additional needs of international graduate students recorded by respondents.

Table 2
Analysis of Variance for the Importance of Subsets of Items Related to Educational Needs of International Graduate Students by College Type

Source	<u>SS</u>	<u>df</u>	<u>MS</u>	<u>F</u>	<u>p</u>
<u>Curriculum</u>					
Model	0.27283900	1	0.2728	0.28	0.5975
Error	148.17309262	152	0.9748		
Total	148.44593162	153			
<u>Research</u>					
Model	3.39690684	1	3.3969	3.90	0.0501
Error	135.93170076	156	0.8713		
Total	139.32860759	157			
<u>Academic advisement</u>					
Model	0.36486821	1	0.3649	0.38	0.5399
Error	154.70440476	160	0.9669		
Total	155.06927298	161			

Conclusions and Discussion

Perceptions held by UMC Agriculture and Education graduate faculty members concerning the selected educational needs of international graduate students (a) differ in regard to the importance and the satisfaction of the needs, (b) differ in that the needs pertaining to research are more important in Agriculture, and (c) are not affected by the degree of involvement with international graduate students and duration of international experience.

International graduate students in the UMC Colleges of Agriculture and Education have important educational needs. Academic program planners working with international graduate students in Agriculture should focus on educational needs of the students pertaining to curriculum and research. Academic program planners in Education should focus on educational needs pertaining to curriculum when working with international graduate students.

In comparison to research and academic advisement needs, curricular needs of international graduate students in the UMC Colleges of Agriculture and Education are least satisfied. Academic program planners working with international graduate students in both Agriculture and Education should focus on the satisfaction of educational needs of the students pertaining to curriculum.

Findings of this study emphasized the importance and the satisfaction of curricular needs of international graduate students. These findings were consistent with the results of related studies.

Within the subset of curricular needs, Increase their level of ability in writing the English language and, Increase their level of ability in speaking the English language were given the highest importance ratings in both Agriculture and Education. Similarly, needs of international students related to English language skills (viz., use of the English language, writing termpapers and participating in classroom discussions, [improving English] language proficiency, understanding lectures and textbooks) were emphasized in studies by Omar, Ahmadian, Quirino and Ramagen, Lanz, Kadi, and Miri-Shaibani.

A significant difference was observed between the perceptions held by the College faculties regarding the importance of selected educational needs of international graduate students pertaining to research. Among the perceptions regarding the satisfaction of educational needs of international graduate students, the perceptions of the needs pertaining to research yielded the greatest difference between the Colleges. These findings were consistent with the results of the study by Lee et al. which showed that perceptions regarding needs of international students differed significantly among academic areas. Recognizing such differences between colleges is of value to educational planners who are involved in developing policies for graduate student research. Attention should be given to educational needs of international graduate students pertaining to research at least on the college level within a university.

The assumptions for using degree of involvement with international graduate students and duration of international experience as covariates were not met in this study. Graduate faculty members' involvement with international graduate students and international experience should therefore not be overriding factors in making decisions related to educational needs of international graduate students. Instead, educational planners should consider distinct practices and philosophies which tend to characterize faculty actions in individual colleges. The planners may then work with faculty members to provide additional experiences designed to meet educational needs of international graduate students.

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