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ABSTRACT

The externship program of the School of Pharmacy of the University of Missouri at Kansas City was evaluated. Both the teaching associate pharmacist and the extern were asked to complete externship evaluation questionnaires at the end of the training. The externships were divided into two groups for analysis of the evaluation questionnaires: those served in hospital pharmacies and those served in community pharmacies. Data indicate that the School of Pharmacy attained its participation goals with respect to the externship program and that both the externs and the teaching associates were generally positive about the value of the experience and the performance of the students. Data also are presented describing students' pre-externship and post-externship responses to a 73-item attitude questionnaire. Student responses generally were in the positive or desirable direction both before and after the externship, and the externship contributed to an enhanced perception among students that they had been well prepared for the practice of pharmacy. Student and teaching associate open-ended comments on the questionnaires as well as interviews indicated that many of the students felt the teaching associates went out of their way to provide a wide range of beneficial learning experiences. (SW)

1979 EVALUATION OF THE UMKC SCHOOL OF PHARMACY EXTERNSHIP PROGRAM

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1979 EVALUATION OF THE UMKC SCHOOL OF PHARMACY EXTERNSHIP PROGRAM

INTRODUCTION

The UMKC School of Pharmacy externship is a learning experience course designed for students in their last academic year. Selected practicing pharmacists, designated as Teaching Associates, supervise the student's development of dispensing and communication skills. These skills are to be perfected in a variety of pharmacy practice settings: hospitals, community pharmacies, nursing facilities, etc. The student is to receive a total learning experience which is as broad as possible in keeping with his or her beginning level. The goals of this course are as follows:

1. To perfect the pharmacy student's ability to communicate with patients and physicians and other health professionals concerning medications and related health matters.

2. To perfect the student's ability and skill in processing the prescription or drug order (receiving, filling, checking and dispensing) and the use of reference material in solving problems encountered in practice.

3. To familiarize the student with drug products.

4. To familiarize the student with various laws governing pharmacy practice and to show how ethical pharmacists abide by these laws.

5. To familiarize the student with third party payment plans.

6. To show the student how to use patient medication records to monitor drug usage and how to deal with drug interactions and drug misuse.

7. To perfect the student's ability to advise the patient concerning OTC products.

8. To familiarize the student with the procedures necessary to the sound management and operation of a pharmacy.

9. To show the student the professional attitude necessary to the practice of pharmacy, the concern for the patient and the roles of the pharmacist.

10. To give the student structured experience in community and institutional pharmacy.

To achieve the goals, the student is assigned for two four-week periods to Teaching Associates who are responsible for supervision of the learning experience.* Only one Teaching Associate is appointed for a four-week period. The Teaching Associate is responsible for ensuring that the student has the opportunity to observe, participate in, and study the various facets of the practice of pharmacy as determined by the objectives and checklist of learning experiences appropriate to the practice situation. The Teaching Associate is to act as counselor and guide to the student and should seek to develop the student's awareness of issues, problems, and opportunities in the profession.**

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*The externship is a four-week period, and most externs serve two consecutive externships for a total of eight weeks. Most externs serve in two different pharmacies while a few stay in the same pharmacy for the entire eight weeks.

**A good deal of the success of the learning experience is dependent on the selection of suitable pharmacists as Teaching Associates. The following criteria are used in the selection process:

1. He/she must be satisfied with pharmacy as a career.
2. He/she must possess professional competency, high standards of ethics, excellent character, and an attitude appropriate to the presence of students.
3. He/she should be willing to accept the role of a teacher and should possess qualities of a good teacher, especially enthusiasm and the ability to communicate with students.
4. He/she should be receptive to new roles of pharmacy and pharmacists and should be active in furthering professional education.
5. He/she should demonstrate concern for the health of his/her patients in the manner in which he/she practices the profession, and in providing adequate information to them concerning their prescriptions and OTC medications or other health aids.
6. He/she should demonstrate concern for the health of his/her community by providing adequate health and drug information to the community.
7. He/she should have good professional relationships with other health professionals in the community and be active in organizations for the benefit of the community.

The Teaching Associate is asked not to assign tasks to students just to get a job done or to simply keep them busy. The student is expected to perform functions normally performed by a pharmacist, under the supervision of the Teaching Associate, but this is done as a learning experience and, also, to achieve competency and proficiency. The Teaching Associate must become familiar with the goals of the course and incorporate the teaching of them into the experience. The Associate must select the objectives appropriate to his or her practice and explore methods of imparting the learning experiences to the particular student.

Because the externship program helps to improve the preparation of pharmacists who will practice in western Missouri and can help improve pharmacy services in underserved parts of this region,* WMAHEC pays cost of living reimbursements of $16 a day to students who serve outside Jackson, Clay, and Platte counties in the 38-county area in which WMAHEC functions. A student extern can be reimbursed for up to eight weeks of learning experience during June, July, and August.

PARTICIPATION IN 1979

The WMAHEC contract for 1977-1978 included the following paragraph stipulating targets for School of Pharmacy externships to be conducted during the summer of 1979:

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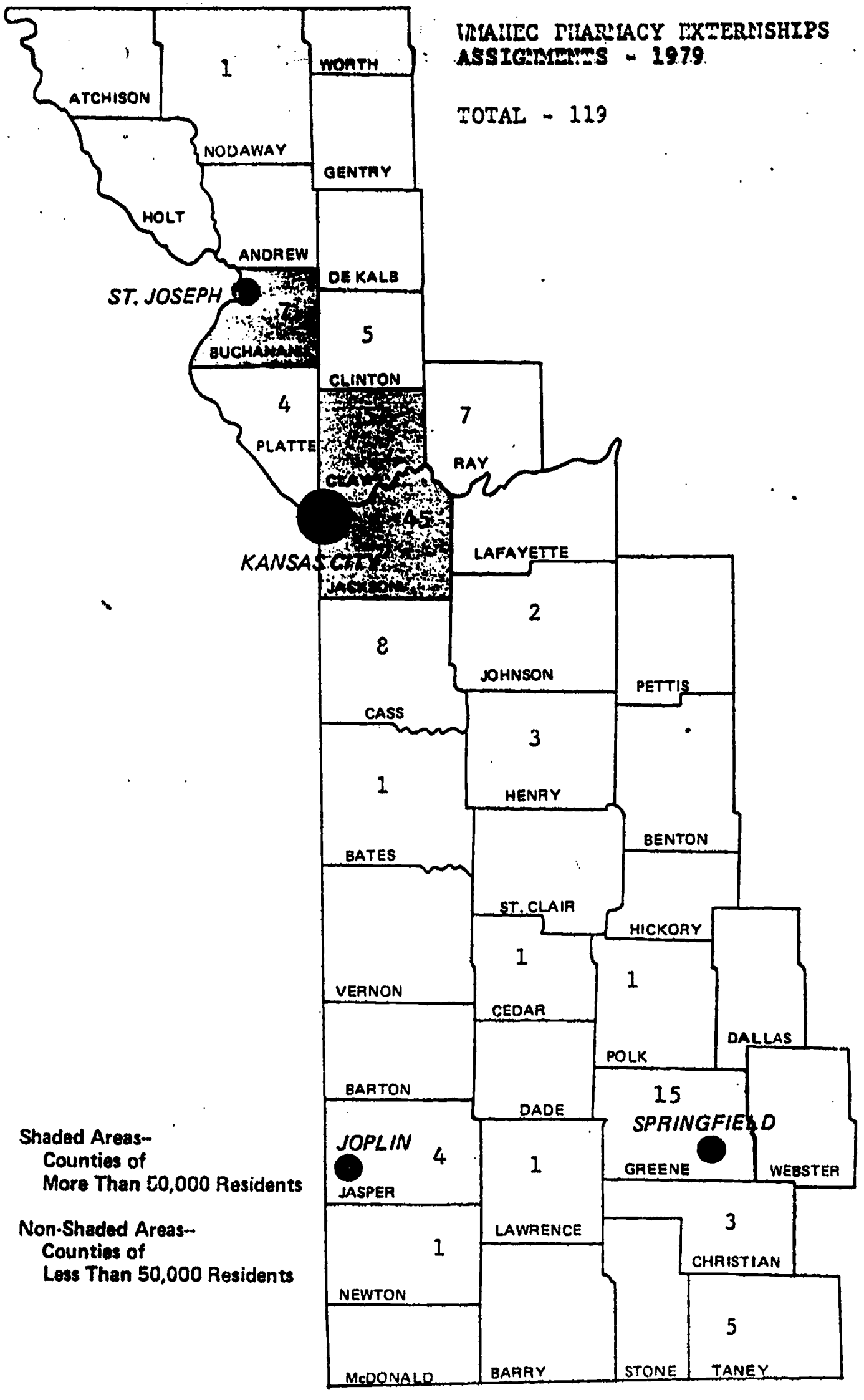
8. His/her pharmacy shall be clean, orderly, well stocked, and have a prescription volume appropriate to a good learning experience for the student.
9. The pharmacy should possess adequate reference materials and possess (or be willing to develop) patient medication records.
10. He/she should be willing to meet with other Teaching Associates and the Coordinators for discussion and improvement of the course.

*This latter aspect of the externship will be discussed in the concluding sections of this report.

WESTERN MISSOURI AREA HEALTH EDUCATION CENTER REGION

WMAHEC PHARMACY EXTERNSHIPS
ASSIGNMENTS - 1979

TOTAL - 119



Shaded Areas--
Counties of
More Than 50,000 Residents

Non-Shaded Areas--
Counties of
Less Than 50,000 Residents

g. Pharmacy Education

Provide at least fifty-five (55) student months of externship experience for UMKC-School of Pharmacy students in the WMAHEC region. Some training shall occur in each designated AHEC.

This goal was clearly met and exceeded by the School of Pharmacy. Completed Externships were as follows:

Northwest region	-	13 months
Southwest region	-	30 months
West-Central region	-	76 months
Outside WMAHEC	-	19 months
Total	-	138 months

Among the 76 months in the West-Central region, 45 were served in Jackson County, and 62 were in the Kansas City Metropolitan Area. (See Figure 1).

Altogether, 70 students participated in the externships. Two of these students served in industrial pharmacies; the remainder served in community and/or hospital pharmacies. Two of the students were registered pharmacists outside the United States. Because these two foreign students and the two students at industrial pharmacies may have had atypical experiences, we have not included them in the analysis of evaluation questionnaires reported below. In addition, one student dropped out of the program during the summer, and one did not complete evaluation forms. Therefore the quantitative analysis in this paper includes 64 students who completed 128 externships, 109 within and 19 outside the WMAHEC region.

EXTERNSHIP EVALUATION QUESTIONNAIRES

In order to evaluate the externship experience of each student, both the Teaching Associate and the extern were asked to complete externship evaluation questionnaires at the end of the training period. The questionnaire items were designed to gauge the student's performance and improvement in a number of areas including: ability to communicate with patients, pharmacy personnel and health professionals; correct processing of medication orders; knowledge of state and federal laws governing pharmacy practice; and an overall evaluation of student progress. Students and pharmacists were also given the opportunity to record any comments pertaining to unique strengths or weaknesses of the extern.

Data were collected for the externships occurring in the summer months of 1979 (WMAHEC's 07 year). For this part of the study, a total of 116 externships were evaluated with 64 students participating.* While the externship experience generally consists of two four-week, externships, a few students serving both externships in the same location did not fill out two evaluation forms. Students completed evaluation forms for 116 externships and Teaching Associates completed evaluation forms for 96 externships for this part of the study.

The externships were divided into two groups for analysis of the evaluation questionnaires: those served in hospital pharmacies and those served in community pharmacies. It was felt that because of the dissimilar operating environments, students would be exposed to different experiences. The questionnaire items for evaluation were somewhat different for hospital externships than for community

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*Some Teaching Associates evaluated more than one extern. Some of the 64 students served both a hospital and a community pharmacy externship. Altogether, 33 students served in 50 hospital pharmacy externships, and 55 students participated in 66 community pharmacy externships.

pharmacies,* therefore, the data for the two types of externships will be analyzed and reported separately.

Analysis of Externships Served in Hospital Pharmacies

During the sixth year of WMAHEC, a total of 50 externships were served by students in hospital pharmacies. The questionnaire given to the Teaching Associate in hospital pharmacy externships has thirteen rating items. The first eight items cover specific areas of expertise such as the extern's understanding of the organizational structure of the hospital, how well the extern processes medication orders, students' ability to communicate with patients and health professionals, and so on. The ninth and tenth items ask the Teaching Associate to rate the student's overall competence and the student's improvement while under his or her direction. Items eleven through thirteen are items concerning the student's appearance, work habits, initiative, and professional attitudes.

Table 1 shows the tallies for each item on the questionnaire given to the Teaching Associate. To assess the fifty hospital pharmacy externships, forty-one evaluations were completed and returned** by the Teaching Associates. For each item a Likert-type scale was used with five categories for response: "Excellent"; "Good"; "Adequate"; "Poor"; and "Unsatisfactory". As shown in Table 1, ratings on all thirteen items generally were in the "Excellent" and "Good" categories. Only on two items did more than 25% of the ratings fall below the "Good" category. These items

*See Appendix B for Hospital Externships questionnaires and Appendix C for Community Externship questionnaires.
**Teaching Associates were asked to complete only one form in cases where students served two externships in the same location.

TABLE 1

Number of Teaching Associate Responses by Evaluation Category, Hospital Pharmacy Externships

Item	Excellent	Good	Adequate	Poor	Unsatisfactory	Total*
1. Understands the organizational structure of the hospital	14	19	6	1		40
2. Processes medication orders correctly and efficiently within the drug distribution system and exhibits responsible control of medications	22	13	6			41
3. Manufactures, compounds, and prepackages medications	13	18	6			37
4. Applies pharmacy laws in an appropriate manner	14	21	5			40
5. Communicates effectively with patients and health professionals	13	18	8	2		41
6. Provides drug information	13	20	8			41
7. Applies accepted inventory control methods	5	20	8			33
8. Understands managerial procedures and responsibilities	4	25	10	2		41
9. Give a rating which summarizes the student's competence	12	22	7			41
10. Since all students do not enter this program with the same background, all cannot be expected to achieve the same degree of competence. So that the student's progress toward competence may be evaluated, give a rating which summarizes the student's improvement while under your direction.	10	20	5	1		36
11. Interest and initiative shown in practice situations	27	9	1	4		41
12. Professional attitude	25	12	3		1	41
13. Neatness in appearance and work habits	25	14	2			41

*Numbers vary due to non-responses.

TABLE 2

Number of Student Responses by Evaluation Category, Hospital Pharmacy Externships

Item	Excellent	Good	Adequate	Poor	Unsatis-factory	Total*
1. Acceptance by and relationship with the Teaching Associate	32	12	6			50
2. Relationships with other employees of the pharmacy	31	12	6	1		50
3. General acceptance as an EXTERN by the other health professionals	17	22	10	1		50
4. General appearance, cleanliness and maintenance of the pharmacy	15	27	7	1		50
5. Space, equipment and library	8	21	16	5		50
6. Processing of drug orders or prescriptions	10	30	10			50
7. Patient medication records	7	21	16	4	1	49
8. Emergency kits and medications on nursing stations	11	21	13	2	3	50
9. Manufacturing, compounding and prepackaging	7	18	19	1	3	48
10. Instruction in state and federal laws	3	18	23	4	1	49
11. Purchasing and inventory control	11	19	13	5	1	49
12. Administrative responsibilities, policies, procedures, and personnel management	13	22	15			50
13. Drug selection, formulary, Pharmacy and Therapeutics Committee	11	13	16	6	3	49
14. Drug information provided to staff and patients	8	22	17	3		50
15. Opportunity to participate in educational activities	16	15	10	4	5	50
16. Opportunity to participate in clinical activities	17	10	12	3	7	49
17. Opportunity to participate in professional activities	15	17	10	4	4	50
18. Evaluation of my OVERALL PROGRESS in THIS learning experience	17	23	9	1		50
19. The extent to which the academic program of the school prepared the student for a successful learning experience in the externship	11	26	13			50

*Numbers vary due to non-responses.

TABLE 3

Number of Teaching Associates Responses by Evaluation Category, Community Pharmacy Externships

Item	Excellent	Good	Adequate	Poor	Unsatis-factory	Total*
1. Processes prescriptions correctly and efficiently	29	23	2	1		55
2. Communicates effectively with patients and health professionals	22	24	7	1	1	55
3. Provides drug information	16	32	5	2		54
4. Applies pharmacy laws in an appropriate manner	24	25	6			55
5. Uses third party payment plans	17	20	16	1		54
6. Applies accepted inventory control methods	14	24	16			54
7. Understands managerial procedures and responsibilities	8	29	16	1		54
8. Utilizes patient profiles or medication records	23	23	2	1		49
9. Give a rating which summarizes the student's competence	20	32	2	1		55
10. Since all students do not enter this program with the same background, all cannot be expected to achieve the same degree of competency. So that the student's progress toward competence may be evaluated, give a rating which summarizes the student's improvement while under your direction	25	23	3	2		53
11. Interest and initiative shown in practice situations	35	18	2			55
12. Professional attitude	40	11	4			55
13. Neatness in appearance and work habits	40	11	4			55

*Numbers vary due to non-responses.

TABLE 4

Number of Student Responses by Evaluation Category,
Community Pharmacy Externships

Item	Excellent	Good	Adequate	Poor	Unsatis-factory	Total*
1. Acceptance by and relationship with the Teaching Associate	41	18	5	2		66
2. Relationships with other employees of the pharmacy	39	23	4			66
3. General acceptance as an EXTERN by the patients of the pharmacy	22	39	4	1		66
4. General appearance, cleanliness and maintenance of the pharmacy	31	23	9	3		66
5. Receipt of prescription, processing of the prescription and delivering to the patient	27	30	9			66
6. Professional and special service offered by the pharmacy	11	28	22	3	2	66
7. Space, equipment and library	6	28	23	8		65
8. Instruction given on professional appliances and OTC drugs	13	22	23	5	3	66
9. Patient medication records	17	22	16	2	9	66
10. Counseling patient on prescription medications	15	29	13	8	1	66
11. Exposure to new medications	9	27	24	2	3	65
12. Counseling patient on OTC drugs	16	24	22	3	1	66
13. Third party payment plans	22	31	10	2	1	66
14. Providing drug information to other health professionals	8	26	22	2	8	66
15. Arrangement of prescription stock	19	29	19	4	3	66
16. Inventory, stock control, buying, etc.	20	27	16	2	1	66
17. Preparation of routine records, reports, establishment of pharmacy plans and policies	19	21	19	4	3	66
18. Personnel management and security matters	14	24	23	4	1	66
19. Instruction in state and federal laws	11	28	23	2	2	66
20. Opportunity to participate in professional activities	16	16	20	3	11	66
21. Opportunity to establish relationships with other health professionals	16	20	23	5	2	66
22. Evaluation of my OVERALL PROGRESS in THIS learning experience	21	34	10	1		66

TABLE 4 continued

Item	Excellent	Good	Adequate	Poor	Unsatis-factory	Total*
23. The extent to which the academic program of the school prepared the student for a successful learning experience in the externship	10	34	18	4		66

*Numbers vary due to non-responses.

were "Communicates effectively with patients and health professionals," on which 10 out of 41 ratings were "Adequate" or "Poor", and "Understands managerial procedures and responsibilities," on which 10 of 41 ratings were "Adequate" and two were "Poor". It is relevant to note that the item on managerial procedures and responsibilities deals with one of the major goals of an off-campus learning experience in the pharmacy education curriculum. Presumably, students are learning about managerial procedures and responsibilities during the externship, but some may not score high on this rating until near the end of the assignment. In this regard it also is relevant to note that 30 of the 36 ratings dealing with "students' improvement" during their externship assignments were in the "Excellent" and "Good" categories. We will discuss the data for the item on "Communicates effectively with patients and health professionals" in a later section of this report.

Table 2 shows students' responses to the hospital planning externship evaluation questionnaire. The items on the student evaluation form are somewhat different from those on the Teaching Associate form. Items deal with relationships with the Teaching Associate, other pharmacy employees and other health professionals; student assessment of his or her extern environment; instruction in specific pharmacy techniques; and the opportunities afforded the extern for exposure to educational, clinical, and professional activities. The student was also asked to rate his or her overall progress and how well the program prepared students for a successful externship.

As shown in Table 2, the students in hospital pharmacy externships generally were positive about their experience. For the two items, the majority of student responses were in the "Excellent" and "Good" categories. These two items were "Instruction in state and federal laws" and "Drug selection, formulary, Pharmacy and Therapeutics Committee." Only on one item--"Opportunity to participate in clinical activities"--were more than 20% of the ratings in the "Poor" or "Unsatisfactory" categories. Forty of the 50 ratings on the item, "Evaluation of my OVERALL PROGRESS in THIS learning experience" were in the "Excellent" and "Good" categories. It is clear that students tended to view the hospital pharmacy externship as a successful learning experience.

Analysis of Externships Served in Community Pharmacies

A total of 66 externships were served by students in community pharmacies. The questionnaire given to the Teaching Associates in community pharmacy externships has 13 items. The scoring system is the same and the items generally are similar to those on the Teaching Associate questionnaire for evaluating students in hospital pharmacy externships, with modifications in items reflecting differences in goals and learning experiences in the two settings. Fifty-five evaluations were completed and returned by the Teaching Associates,* whose responses are tallied in Table 3.

As shown in Table 3, ratings on all thirteen items generally were in the "Good" and "Excellent" categories. On only three items did as many as 20% of the ratings fall below the "Good"

*Teaching Associates were asked to complete only one form in cases where students served two externships in the same location.

category. These three items were: "Uses third party payment plans"; "Applies accepted inventory control methods"; and "Understands managerial procedures and responsibilities". As in the case of hospital pharmacy externships, it is relevant to note that students are learning about managerial procedures and responsibilities during the externship, and presumably would rank low in this area during the initial weeks. Similarly, many apparently have had little opportunity previously to learn about third party payment plans and inventory control methods. As we did with respect to the Teaching Associate ratings of hospital planning externs, we should note that the large majority of students--those in 48 out of 53 externships--were perceived as having made excellent or good improvement during the externships.

Table 4 shows students' responses to the community pharmacy externship evaluation questionnaire. There are 23 items on this questionnaire, using the same scoring system as the student questionnaire for evaluating hospital pharmacy externships. As shown in Table 4, the students in community pharmacy externships generally were positive about their experience. For every item, the majority of responses were in the "Excellent" and "Good" categories. On no item were as many as 20% of the responses in the "Poor" or "Unsatisfactory" categories. Fifty-five of 66 ratings on the item "Evaluation of my OVERALL PROGRESS in THIS learning experience" were in the "Excellent" and "Good" categories. It is clear that students tended to view the community pharmacy externship as a successful learning experience.

Additional Student Ratings of the Externship

Additional evidence bearing on student evaluation of the externship experience also was obtained from an attitude questionnaire (described in the following section) which students filled out after completing their externship assignments. Following 73 items dealing with a variety of issues in pharmacy education and practice, the questionnaire asked students to "rank the success" of their first externship assignment using one of five categories: Very successful; Successful; Neither a success nor a disappointment; Mildly disappointing; and Strongly disappointing. Of the 63 students who responded, 54 categorized their externship as either "Very successful" or "Successful"; only four students ranked their externships as disappointing. Asked a similar question regarding their second externship, 78% of the students who responded selected the categories "Very successful" or "Successful". Thus the data from these items agree with responses to items on the student evaluation questionnaires on which a large majority of the students said that their externships were "Excellent" or "Good" in terms of facilitating their "overall progress" in completing their assignments.

PRE-POST ATTITUDE QUESTIONNAIRE

To provide additional data useful in assessing the School of Pharmacy overall curriculum and the externship in particular, Professor Noel O. Nuessle and his colleagues on the faculty prepared a 73-item questionnaire dealing with students' attitudes regarding a variety of issues in pharmacy education and the practice of pharmacy. These items were incorporated into a questionnaire including descriptive information on student background, career choices, and other matters. We already have referred to the items asking students to rank the success of their externship assignments. Items on the questionnaire are shown in Table 5.

The 73 items were designed to assess student attitudes on ten types of issues which can be categorized under the following headings:

1. Pharmacy as a Profession - 7 items.
2. Patient Medication Records - 6 items.
3. Over the Counter Drugs - 6 items.
4. Rx Medications - 7 items.
5. Patient-Pharmacist Relationships - 7 items.
6. Physician-Pharmacist Relationships - 7 items.
7. Management of a Pharmacy - 9 items.
8. Pharmacists' Responsibilities for Drug Use - 7 items.
9. Adequacy of Preparation at the School of Pharmacy - 6 items.
10. School of Pharmacy Curriculum - 11 items.

All of the items had five response categories as follows: Strongly Agree; Agree; Uncertain-Neutral; Disagree; and Strongly

TABLE 5 (continued on next page)

5.a.

Item and Factor Information Regarding Attitudes Toward Pharmacy as a Profession

Items	Pre-Test Mean (N^{78} = 56) (N^{79} = 64)	S.D.	Post-Test Mean (N^{78} = 56) (N^{79} = 64)	S.D.	Pre-Test Principal Factor loadings	Post-Test Principal Factor Loadings	(197 Pos Pre p*
1. The practice of pharmacy represents a high level of professional behavior.*	4.34 4.30	.67 .69	4.29 4.31	.49 .59	.34 .38	.57 .63	n.s.
2. One who practices pharmacy as a profession can expect to be a financial success.*	3.16 3.22	.91 .97	3.12 3.34	.85 1.01	.15 .25	.35 .47	n.s.
3. The practice of pharmacy as a profession represents the performance of a social service.*	4.16 3.98	.65 .90	4.07 4.17	.68 .58	.22 .48	.42 .69	n.s.
4. The practice of pharmacy represents an opportunity to work with many interesting people.*	4.27 4.41	.77 .66	4.21 4.25	.68 .62	.76 .60	.77 .60	n.s.
5. The practice of pharmacy is a profession where one needs constantly to develop new skills and master new concepts and knowledge.*	4.63 4.61	.75 .73	4.59 4.53	.50 .71	.75 .74	.56 .50	n.s.
6. The practice of pharmacy is a profession in which one can use his/her education to help sick people.*	4.48 4.48	.66 .50	4.30 4.44	.66 .59	.77 .53	.83 .71	n.s.
7. If I were just graduated from high school, I would still enter the pharmacy profession.*	3.46 3.47	1.14 1.14	3.59 3.56	.93 .92	.71 .70	.60 .54	n.s.

*Strongly Disagree = 1; Strongly Agree = 5. For other items, Strongly Disagree = 5; Strongly Agree = 1.

**p values are one-tailed probabilities using the Wilcoxon Matched-Pairs Ranked-Signs Test.

TABLE 5 (continued)
5.b.

Item and Factor Information Regarding Attitudes Concerning Patient Medication Records

Items	Pre-Test Mean (N^{78} = 56) (N^{79} = 64)		Post-Test Mean (N^{78} = 56) (N^{79} = 64)		Pre-Test Principal Factor Loadings	Post-Test Principal Factor Loadings	p**
		S.D.		S.D.			
1. Patients receive better health care at pharmacies which maintain patient medication records.*	4.04 3.94	.83 .87	4.01 3.81	.92 .83	.76 .80	.84 .81	n.s.
2. The incidence of drug induced disease would probably decrease markedly if pharmacies maintained patient medication records.*	3.82 3.73	.83 .88	3.84 3.84	.97 .76	.85 .83	.71 .77	n.s.
3. Patient medication records need not be maintained for hospital out patients.	3.63 3.69	.96 .94	3.63 3.78	.93 .81	.16 .60	.29 .11	n.s.
4. The maintenance of OTC drug purchases on patient medication records is usually not very practical.	3.23 3.09	1.19 1.14	2.91 3.00	1.05 1.07	.14 .43	.32 .50	n.s.
5. Patient compliance will be better if the pharmacy maintains patient medication records.*	3.61 3.22	.85 .86	3.50 3.34	.95 .76	.67 .20	.78 .77	n.s.
6. I expect to keep patient medication records in my own pharmacy (as owner, manager or director of pharmacy services).*	4.38 4.19	.70 .75	4.19 4.22	.65 .63	.79 .65	.51 .50	n.s.

*Strongly Disagree = 1; Strongly Agree = 5. For other items, Strongly Disagree = 5; Strongly Agree = 1.
**p values are one-tailed probabilities using the Wilcoxon Matched-Pairs Ranked-Signs Test.

TABLE 5 (continued)
5.c.

Item and Factor Information Regarding Attitudes Toward Pharmacist Behavior Concerning Over the Counter Drugs

Item	Pre-Test Mean (N^{78} = 56) (N^{79} = 64)	S.D.	Post-Test Mean (N^{78} = 56) (N^{79} = 64)	S.D.	Pre-Test Principal Factor Loadings	Post-Test Principal Factor Loadings	p**
1. I believe most pharmacists advise patients regarding OTC drug products on the basis of the profit to be made.	3.62 3.61	.86 .95	3.79 3.83	.68 .85	.47 .62	.57 .87	n.s.
2. I believe most pharmacists do not advise the patient that the OTC product they have chosen is of little value for the patient's condition.	2.68 2.94	1.01 .91	2.96 3.06	.93 1.01	.67 .50	.48 .81	n.s.
3. Most OTC products are so clearly labeled with directions and indications that most patients do not need the pharmacist's advice.	4.11 4.20	.78 .74	3.96 3.94	.85 .71	.53 .64	.68 .25	.01
4. In my opinion most pharmacists' OTC drug advice to the patient is based on their own experiences and reading of professional journals.*	3.83 3.75	.67 .65	3.77 3.91	.69 .66	.04 -.47	.19 .06	.05
5. In my opinion most pharmacists readily ask the patient about symptoms when advising about OTC drugs.*	3.84 3.38	.90 1.01	3.55 3.64	.78 .88	.45 -.15	.74 .01	n.s.
6. I would find it difficult to ask patients about their symptoms when advising about OTC drugs.	4.32 4.41	.70 .64	4.14 4.34	.64 .67	.81 .64	.21 .49	n.s.

*Strongly Disagree = 1; Strongly Agree = 5. For other items, Strongly Disagree = 5; Strongly Agree = 1.
**p values are one-tailed probabilities using the Wilcoxon Matched-Pairs Ranked-Signs Test.

TABLE 5 (continued)
5.d.

Item and Factor Information Regarding Attitudes Toward Rx Medications

Item	Pre-Test Mean (N^{78} = 56) (N^{79} = 64)	S.D.	Post-Test Mean (N^{78} = 56) (N^{79} = 64)	S.D.	Pre-Test Principal Factor Loadings	Post-Test Principal Factor Loadings	p**
1. I believe most pharmacists only advise patients concerning their Rx medications if the patient indicates that he or she is interested.	2.75 2.75	.96 .97	2.89 2.86	.99 1.01	.48 .13	.56 .26	.01
2. Patients may not take their Rx as prescribed if the pharmacist advises them regarding side effects of the drug.	2.86 3.08	.94 .92	2.79 3.05	.87 .88	.82 .78	.77 .83	n.s.
3. Patients may become alarmed about the physicians choice of drug if the pharmacist advises them regarding the toxicity of the drug.	2.45 2.65	.81 .92	2.50 2.66	.85 .82	.69 .84	.81 .74	n.s.
4. In my opinion most pharmacists readily ask the patient about symptoms when advising about Rx medications.*	2.57 2.64	.87 .87	2.86 2.83	.86 .83	.43 .29	.47 .36	.05
5. Patients who have been on maintenance Rx's for three months or more need not be advised about their Rx medications.	3.80 4.03	.86 .74	3.86 3.63	.61 .70	.14 .14	.38 .27	.001
6. Pharmacists' attempts to advise regarding Rx medications will cause the patient to assume that the drug or dosage is wrong or unusual.	4.11 3.79	.62 .74	4.00 3.92	.47 .74	.40 .66	.39 .64	n.s
7. I would find it difficult to ask patients about their symptoms when advising about Rx medications.	4.04 4.21	.79 .86	4.17 4.23	.72 .62	.45 .32	.45 .16	n.s

*Strongly Disagree = 1; Strongly Agree = 5. For other items, Strongly Disagree = 5; Strongly agree = 1.
**p values are one-tailed probabilities using the Wilcoxon Matched-Pairs Ranked-Signs Test.

TABLE 5 (continued)
5.e.

Item and Factor Information Regarding Attitudes Concerning Patient-Pharmacist Relationships

Items	Pre-Test Mean (N^{78} = 56) (N^{79} = 64)		Post-Test Mean (N^{78} = 56) S.D. (N^{79} = 64)		Pre-Test Principal Factor Loadings	Post-Test Principal Factor Loadings	p**
		S.D.		S.D.			
1. Patients who have been advised by the pharmacist about the use of Rx medication are more likely to comply with the proper dosage regimen than those who were not advised.*	4.18 4.25	.72 .65	4.11 4.25	.73 .62	.72 .68	.51 .51	n.s
2. Most patients appreciate the pharmacists' efforts to discuss their Rx's, disease states, etc.*	4.09 4.25	.72 .67	4.14 4.20	.75 .54	.59 .80	.73 .75	n.s
3. I believe most patients readily accept a pharmacist's advice on OTC drugs.*	4.00 4.13	.66 .77	4.00 3.73	.54 .72	.69 .78	.58 .71	n.s
4. In my opinion most patients will accept the pharmacist's OTC recommendations over a highly advertised product.*	3.64 4.00	.88 .74	3.68 3.77	.64 .71	.76 .70	.46 .67	n.s
5. Most patients are quite willing to discuss their symptoms with the pharmacist.*	3.25 3.54	.84 .74	3.63 3.87	.65 .64	.71 .61	.76 .73	.001
6. Most patients regard pharmacists as knowledgeable in regard to their medical problems.*	3.54 3.59	.76 .77	3.82 3.87	.66 .64	.52 .45	.60 .68	.01
7. Patients are more interested in the price of the Rx than special services the pharmacist may provide, such as advertisement, patient records, etc.	2.56 2.75	.97 1.01	2.61 2.97	1.07 .84	.50 .07	.57 .35	n.s

*Strongly Disagree = 1; Strongly Agree = 5. For other items, Strongly Disagree = 5; Strongly Agree = 1.
**p values are one-tailed probabilities using the Wilcoxon Matched-Pairs Ranked-Signs Test.

TABLE 5 (continued)
5.f.

Item and Factor Information Regarding Attitudes Concerning Physician-Pharmacist Relationships

Item	Pre-Test Mean (N^{78} = 56) (N^{79} = 64)	S.D.	Post-Test Mean (N^{78} = 56) (N^{79} = 64)	S.D.	Pre-Test Principal Factor Loadings	Post-Test Principal Factor Loadings	p**
1. In my opinion most physicians readily accept the pharmacist's suggestions on drug choice.*	2.80 2.75	.81 .97	2.98 3.18	.98 .77	.57 .58	.67 .39	.001
2. I believe most pharmacists readily advise physicians about drug interactions, inappropriate drug therapy, etc.*	2.45 2.39	.91 1.00	2.53 2.64	.97 .87	.71 .56	.54 .61	n.s.
3. Most physicians appreciate pharmacists advising them about drug intereactions.*	3.38 3.22	.82 .90	3.20 3.21	.86 .86	.65 .75	.69 .78	n.s.
4. Physicians usually do not change drugs when advised of a drug interaction.	3.34 3.36	.77 .70	3.34 3.38	.84 .66	.39 .47	.56 .39	n.s.
5. Physicians regard pharmacist's advice on treatment as an encroachment of their field of experience.	2.75 2.66	.72 .82	2.56 3.06	.91 .74	.59 .77	.70 .74	.001
6. I believe most physicians do not want the pharmacist to advise patients in regard to their medical problems.	3.39 3.48	.93 .85	3.26 3.52	.79 .76	.26 .68	.55 .42	n.s.
7. I would not hesitate to call a physician about the choice of drug if I felt it might be inappropriate.*	3.82 4.06	1.06 .79	3.79 4.08	.85 .79	.53 .20	.41 .16	n.s.

*Strongly Disagree = 1; Strongly Agree = 5. For other items, Strongly Disagree = 5; Strongly Agree = 1.
**p values are one-tailed probabilities using the Wilcoxon Matched-Pairs Ranked-Signs Test.

TABLE 5 (continued)
5.g.

Item and Factor Information Regarding Attitudes Concerning the Management of a Pharmacy

Item	Pre-Test Mean (N^{78} = 56) (N^{79} = 64)	S.D.	Post-Test Mean (N^{78} = 56) (N^{79} = 64)	S.D.	Pre-Test Principal Factor Loadings	Post-Test Principal Factor Loadings	p**
1. It is my opinion that the pharmacist should be able to interpret a financial statement.*	3.79 3.92	.90 .91	4.05 4.03	.64 .86	.70 .81	.77 .72	n.s.
2. I believe a pharmacist should be able to prepare a yearly budget for the pharmacy.*	3.78 3.97	.84 .80	3.86 4.08	.72 .73	.84 .82	.86 .57	n.s.
3. I believe the pharmacist should be able to write a job description for all pharmacy personnel.*	4.15 4.09	.63 .68	4.18 4.18	.58 .71	.56 .74	.72 .69	n.s.
4. In my opinion the pharmacist should be the only one in the pharmacy to make purchasing decisions about prescription drugs.*	3.72 3.66	1.11 1.09	3.70 3.79	.99 1.05	.06 .01	.08 .31	n.s.
5. In my opinion the pharmacist should be able to recruit, train, and motivate pharmacy personnel.*	4.22 4.20	.51 .57	4.40 4.22	.41 .75	.69 .32	.64 .85	n.s.
6. I believe the pharmacist should be able to develop and implement layout plans for the pharmacy.*	3.98 4.11	.63 .67	3.93 4.11	.76 .72	.82 .54	.87 .84	n.s.
7. I believe the pharmacist should be able to prepare a financially acceptable and competitively priced compensation plan for pharmacy personnel.*	3.78 3.67	.79 .84	3.82 3.93	.72 .84	.87 .84	.77 .91	.05
8. In my opinion the pharmacist should be able to identify, classify and recover all costs of pharmacy operations including a fair and adequate return on invested capital.*	3.94 3.92	.68 .84	4.01 4.10	.80 .67	.68 .80	.80 .71	n.s.
9. In my opinion the pharmacist should be familiar with contemporary electronic data processing	3.44 3.45	.90 .80	3.38 3.70	.98 .83	.77 .54	.54 .27	.03

*Strongly Disagree = 1; Strongly Agree = 5. For other items,

TABLE 5 (continued)
5.h.

Item and Factor Information Regarding Attitudes Concerning Pharmacists' Responsibilities for Drug Use

Item	Pre-Test Mean (N^{78} = 56) (N^{79} = 64)	S.D.	Post-Test Mean (N^{78} = 56) (N^{79} = 64)	S.D.	Pre-Test Principal Factor Loadings	Post Test Principal Factor Loadings	p**
1. I believe the pharmacist should determine if the patient is taking the drug in the prescribed manner.*	4.34 4.28	.58 .55	4.34 4.17	.58 .49	.54 .73	.73 .61	n.s
2. I believe the pharmacist should consult with the patient at the time the prescription is dispensed.*	4.57 4.45	.53 .69	4.59 4.34	.53 .57	.57 .72	.71 .64	n.s
3. In my opinion the pharmacist must ensure that the prescription meets all the legal requirements.*	4.71 4.72	.46 .55	4.63 4.63	.62 .49	.65 .62	.66 .80	n.s
4. In my opinion the pharmacist must ensure that the patient receives the prescribed medication.*	4.42 4.67	.71 .57	4.63 4.63	.65 .49	.53 .65	.74 70	n.s
5. I believe that the pharmacist should review the patient's medication record before filling the patient's prescription.*	4.34 4.39	.64 .58	4.32 4.22	.63 .60	.61 .75	.71 .74	.03
6. In my opinion the pharmacist should add all pertinent information to the prescription container to clarify directions and ensure the patient takes the medication properly.*	4.33 4.47	.71 .84	4.42 4.42	.71 .69	.69 .51	.46 .71	n.s
7. I believe the pharmacist must ensure that the patient understands the storage requirements for certain specific products.	4.50 4.64	.50 .52	4.55 4.50	.50 .54	.69 .68	.78 .80	.04

*Strongly Disagree = 1; Strongly Agree = 5. For other items, Strongly Disagree = 5; Strongly Agree = 1.
**p values are one-tailed probabilities using the Wilcoxon Matched-Pairs Ranked-Signs Test.

TABLE 5 (continued)
5.i.

Item and Factor Information Regarding Attitudes Concerning Adequacy of Preparation

Item	Pre-Test Mean (N^{78} = 56) (N^{79} = 64)	S.D.	Post-Test Mean (N^{78} = 56) (N^{79} = 64)	S.D.	Pre-Test Principal Factor Loadings	Post-Test Principal Factor Loadings	p**
1. I feel adequately prepared to assume the practice of pharmacy as the only pharmacist in the pharmacy.*	3.79 3.59	.97 1.08	4.18 4.03	.69 .71	.84 .85	.78 .84	.001
2. I feel adequately prepared to assume the practice of pharmacy as one of two pharmacists in the pharmacy even though I would be the only pharmacist on either the morning or evening shift.*	4.14 4.08	.75 .82	4.46 4.42	.54 .59	.86 .83	.85 .85	.001
3. I feel adequately prepared to assume practice as a pharmacist in a hospital.*	3.21 3.34	1.23 1.28	3.70 3.61	1.08 1.23	.40 .59	.64 .30	.05
4. I feel adequately prepared to assume practice as a pharmacist in a community pharmacy.*	3.98 4.11	.90 .72	4.34 4.27	.67 .76	.63 .81	.74 .81	n.s.
5. I feel adequately prepared to institute new programs (unit dose, I.V. admixtures, patient profiles, etc.) in a hospital pharmacy.*	3.00 3.03	1.20 1.27	3.38 3.34	1.14 1.25	.45 .58	.65 .34	.01
6. I feel adequately prepared to analyze and change managerial operations (pharmacy department layout, store arrangement, buying policies, etc.) of a community pharmacy.*	3.13 3.14	1.06 1.07	3.38 3.52	.86 .93	.51 .55	.12 .49	.01

*Strongly Disagree = 1; Strongly Agree = 5. For other items, Strongly Disagree = 5; Strongly Agree = 1.
**p values are one-tailed probabilities using the Wilcoxon Matched-Pairs Ranked-Signs Test.

TABLE 5 (continued)
5.j.

Item and Factor Information Regarding Attitudes Toward the School of Pharmacy Curriculum

Item	Pre-Test Mean (N^{78} = 56) (N^{79} = 64)	S.D.	Post-Test Mean (N^{78} = 56) (N^{79} = 64)	S.D.	Pre-Test Principal Factor Loadings	Post-Test Principal Factor Loadings	p*
1. The School of Pharmacy curriculum is excellent preparation for the practice of pharmacy.*	3.20 3.02	.85 .93	3.31 3.33	.94 .76	.81 .90	.82 .79	.0
2. The curriculum of the School of Pharmacy provides sound preparation for the practice of pharmacy as it is today.	3.44 3.20	.88 1.00	3.25 3.39	.97 .81	.78 .80	.74 .84	n.
3. The curriculum of the School of Pharmacy provides sound preparation for the practice of pharmacy in the future.*	3.20 3.28	.80 1.02	3.41 3.44	.83 .79	.79 .92	.78 .83	n.
4. The curriculum of the School of Pharmacy provides sound preparation to keep abreast of changes in the practice of pharmacy in the years to come.*	3.22 3.55	.90 .87	3.40 3.55	.76 .67	.88 .87	.84 .84	n.

Item	Pre-Test Number by Response Category 1	2	3	Post-Test Number by Response Category 1	2	3		
5. The School of Pharmacy curriculum contains enough course work in the area of basic sciences (chemistry, biology, physics, mathematics.)	3 8	44 49	9 7	1 12	49 50	5 2	-	-
6. The curriculum of the School of Pharmacy contains enough course work in the humanities and arts (English, psychology, art, literature, sociology, history, languages, etc.)	9 8	34 42	13 14	9 10	35 44	11 10	-	-
7. The curriculum of the School of Pharmacy contains enough course work in pharmacology, public health and physiology.	0 1	22 40	34 23	0 0	23 40	32 24	-	-
8. The curriculum of the School of Pharmacy contains enough course work in pharmaceutical chemistry and biochemistry.	10 10	38 35	8 18	7 10	40 41	8 13	-	-

TABLE 5 (continued)
5.3. continued

Item	Pre-Test Number by Response Category			Post-Test Number by Response Category			Pre-Test Principal Factor Loadings	Post-Test Principal Factor Loadings
	1	2	3	1	2	3		
9. The curriculum of the School of Pharmacy contains enough course work in pharmaceutics (dispensing, basic pharmacy, physical pharmacy, compounding, preparation, pharmach technology and biopharmaceutics.)	3 10	30 38	23 16	6 4	31 41	8 19	-	-
10. The curriculum of the School of Pharmacy contains enough course work in clinical pharmacy.	9 19	21 28	6 17	11 23	17 29	27 12	-	-
11. The curriculum of the School of Pharmacy contains enough course work in pharmacy management (law, marketing, management, etc.)	5 12	38 31	12 21	6 9	33 29	16 26	-	-

*Strongly Disagree = 1; Strongly Agree = 5. For other items, 1 = Need Less; 2 = Right Amount; 3 = Need More.
**p values are one-tailed probabilities using the Wilcoxon Matched-Pairs Ranked-Signs Test.

Disagree. Items for which agreement was considered desirable were scored with a five for "Strongly Agree" and a one for "Strongly Disagree." Items for which disagreement was considered to be the desirable response were scored in the opposite direction. Therefore a "high" or desirable score on each item is represented by a high numerical score.*

The questionnaire was administered to students in the late spring of 1979, before they began their externships, and again in late August just after they had completed these assignments. Hence the questionnaires allow one to ask whether there were clear changes in student attitudes associated with the externship experience. The purpose of this section of our report is to examine this issue.

Reliability

In order to assess the reliability of the questionnaire, fifteen graduating seniors who responded in the spring of 1979 prior to their summer externships were asked to return several weeks later to respond again. Students in this group were randomly selected from the graduating class of 1979 and were told that their responses had been inadvertently destroyed. Using this approach, we were able to determine whether responses were relatively stable over a period of several weeks.

Data collected for this purpose indicated that re-test responses seldom were more than one category different from the pre-test scores. As mentioned above, there were 73 items on the questionnaire and fifteen students who responded twice. However, one student left fifteen blanks on the pre-test. This

*This is not true, however, for the last 7 items, for which the "desirable" score is 2 (the "right amount" of a curriculum component) and scores of 1 ("Need Less") and 3 ("Need More") are "undesirable".

means that there were 1080 pre-post comparisons (73 x 15 - 15 = 1080). Among these comparisons, 371 post-test responses were one category higher or lower than the pre-test, only 78 were two categories higher or lower, and only six were three categories higher or lower.

In terms of an overall reliability score, this means that the average pre-to-post deviation was only half of one category ((371 x 1 = 371) + (78 x 2 = 146) + (6 x 3 = 18) = 535 ÷ 1080 = .495). Alternately, one can compute the total number of possible deviations at four categories per item times 73 items times 15 respondents minus four times the fifteen items left blank. Using this computation, there were 535 deviant responses out of a possible 4320. (73 x 15 x 4 = 4380 - 60). The reliability estimate calculated this way is 88 percent (535 ÷ 4320 = .12). Both calculations indicate that questionnaire responses generally are stable over a period of several weeks.

Factor Analysis

The first step in our analysis was to perform a factor analysis on each set of items in the ten categories described above in order to determine whether items within each category could be added together to form scales reflecting one general attitude underlying all or some of the items.* The factor analysis was carried out by performing a principal components analysis with unity in the matrix diagonal for each of the ten sets of items, and then performing a varimax rotation.

*Questionnaires filled out by 64 student respondents were used in this part of the study. Questionnaires filled out by two respondents who were registered pharmacists in other countries were not used.

This procedure was followed separately for the pre- and post-test administrations of the questionnaire. The principal factor loadings* for the ten sets of items are shown in Table 5, sections 5.a. through 5.j. Table 5 reports data for students serving externships in 1978 as well as 1979, in order to provide information on the administration of the questionnaire both years. Throughout the table, information from 1978 students is provided above information from 1979 students. Thus the pre-test mean of 4.34 on item one in section 5.a. is for 1978 students; the next row shows the pre-test mean (4.30) for 1979 students.

There are no set rules for deciding whether the results of a factor analysis indicate that a group of items should or should not be summarized by one score. Because the items in each category had been explicitly constructed to constitute a set, we decided in 1978 that they should be added together in this exploratory study if they met relatively minimal requirements for correlation with others in the set. Accordingly, we decided generally to keep items together if they loaded at .35 or above with other items in the set in either the pre-test or the post-test factor analysis. However, having a second year of data allows us to construct scales that should be more stable for future studies. Therefore we constituted scales for this study (1979) only with items that loaded at .30 or above on both the pre-test and the post-test for both years. Application of this approach led us to construct 12 equal-weighted scales which are described below.

*Factor loadings can be considered as representing the correlation between an item and an underlying construct responsible for correlations among a group of items in which the item in question is included.

1. Positive vs. Negative Attitudes Toward Pharmacy as a Profession.

This scale included items 1,4,5,6, and 7 dealing with pharmacy as a profession. These items seem to represent positive vs. negative attitudes toward pharmacy as a profession.

2. Emphasis on Maintenance of Patient Medication Records.

Items 1,2, and 6 from the set of attitudes dealing with patient medication records were added together to constitute this scale. The highest loading items were "Patients receive better health care at pharmacies which maintain patient medication records" and "The incidence of drug induced disease would probably decrease markedly if pharmacies maintained patient medication records". It should be noted that the three items which loaded above .30 on the factor all were worded in a positive direction, while two of the three items which did not load on the principal factor were worded in a negative direction. Thus it seems possible that loadings on the factor are reflecting a response set which may lead some respondents to agree quickly with positively worded items but pause and consider more fully those items which are worded in a negative direction.

3. Positive vs. Negative Attitudes Regarding Pharmacist Behavior Concerning Over the Counter Drugs.

Items 1 and 2, from the set of six items dealing with pharmacists and over-the-counter drugs were added together to form this scale. Neither of the two items loaded above .62 on both the pre- and the post-test.

4. Pharmacist Role in Informing Patients About Rx Medications.

Items 2,3, and 6 dealing with Rx medications were added together to form this scale. The highest loading items were

"Patients may not take their Rx as prescribed if the pharmacist advises them regarding side effects of the drug" and "Patients may become alarmed about the physician's choice of drug if the pharmacist advises them regarding the toxicity of the drug". Items on the scale tap differing aspects of the pharmacist's responsibilities and influence in advising patients about Rx medications.

5. Positive vs. Negative View of Patient Behavior Related to Pharmacists' Advice.

The first six items dealing with patient-pharmacist relationships were added together to form this scale. The items seem to tap viewpoints concerning whether patients are open to receive information and suggestions regarding the appropriate use of drugs.

6. Positive vs. Negative View of Physician Behavior with Respect to Drugs.

The first five items dealing with physician-pharmacist relationships were added together to form this scale. The highest loading items were "Most physicians appreciate pharmacists advising them about drug interactions" and "Physicians regard pharmacist's advice on treatment as an encroachment of their field of experience". The items seem to tap viewpoints concerning whether physicians are open to information and suggestions regarding the appropriate use of drugs.

7. Wide vs. Narrow Definition of Pharmacists' Managerial Responsibilities.

All but items 4 and 9 in the set of 9 items dealing with management of a pharmacy were added together to form this scale.

These seven items represent diverse management skills that a pharmacist might need to master to operate a pharmacy successfully.

8. Active vs. Passive Pharmacist Role in Dispensing Drugs.

All seven items dealing with pharmacists' responsibilities for drug use were added together to form this scale. Each of the items had loadings of at least .46 on both the pre-test and the post-test. The seven items describe a variety of ways in which a pharmacist can make a special effort to ensure that drugs are used appropriately.

9. Adequate vs. Inadequate Preparation at the School of Pharmacy.

Three separate scales were constructed based on the 6 items dealing with adequacy of preparation at the School of Pharmacy. The first used the first five items, following an examination of the loadings which showed that each of these items loaded at .30 or above on both the pre-test or the post-test in both 1978 and 1979. The six items portray differing aspects of respondents' perception concerning the degree to which they felt adequately prepared to begin practicing pharmacy.

10. Adequate vs. Inadequate Preparation for a Hospital Pharmacy.

Items 3 and 5 were added together to form this sub-scale after the varimax factor rotation (not shown in this report) indicated that these two items dealing with hospital pharmacies formed a separate orthogonal factor.

11. Adequate vs. Inadequate Preparation for Working Independently as a Pharmacist.

Items 1,2, and 4 were added together to form this sub-scale after the varimax factor rotation indicated that the three formed

a separate orthogonal factor. The three items seem to tap respondents' feelings about the degree to which they are prepared to work independently as a practicing professional.

12. Positive vs. Negative Views of the School of Pharmacy Curriculum.

The first four of the set of 11 items dealing with the School of Pharmacy curriculum were added together to form this scale. All four items tap general perceptions of the curriculum by asking whether it provides sound preparation for the practice of pharmacy today and in the future. It should be noted that the remaining seven items, which were not included in the factor analysis, deal with specific components of the curriculum and use different rating categories (scored 1 to 3 in nominal categories rather than 1 to 5 in ordinal categories) than did the preceding 66 items.

General Response Level

Before proceeding to discuss pre-post scores on the scales and the individual items, we should call attention to the general level of response to the items and the questionnaire as a whole. By definition, a high score was considered to be a "desirable" response and a low score was considered to be undesirable, with scores ranging from 1 to 5 on the first 66 items. Examination of the data in Table 5 supports the following conclusions:

1. Scores for 1979 students were very similar to scores for 1978 students. For the 66 items with ordinal categories, only seven of 122 comparisons (66 pre-test and 66 post-test) show differences between the two groups' mean scores as high as .30 on the five-point scale, and none are greater than .50. This finding suggests that the questionnaire yields stable and reliable results for a student population.

2. Scores on attitudes regarding pharmacy as a profession generally were high--usually over 4 on the five-point scale. The lowest scores were for the items "One who practices pharmacy as a profession can expect to be a financial success" and "If I were just graduated from high school I would still enter the pharmacy profession."

3. Scores on attitudes concerning patient medication records generally were high--usually over 3.22. The only item for which this is not true states that "The maintenance of OTC drug purchases on patient medication records is usually not very practical."

4. Scores on attitudes toward pharmacist behavior concerning over-the-counter drugs generally were high--usually over 3.38. The only item for which this is not true states that "I believe most pharmacists do not advise the patient that the OTC product they have chosen is of little value for the patient's condition."

5. Scores on attitudes toward Rx medications were not as high as were scores on the preceding items--four of the seven items had scores below 3.05. It might be concluded, however, that responses to items in this part of the questionnaire are even more open to interpretation than is true elsewhere on the questionnaire. For example, it may not be completely clear that it is desirable for students to disagree with the item stating that "Patients may become alarmed about physician's choice of drug if the pharmacist advises them regarding the toxicity of the drug."

6. Scores on attitudes concerning patient-pharmacist relationships generally were high--usually over 3.25. The only item

for which this was not true states that "Patients are more interested in the price of the Rx than special services the pharmacist may provide, such as advertisement, patient records, etc."

7. Scores on attitudes concerning physician-pharmacist relationships were not as high as were scores on most other parts of the questionnaire. This in part is because our "desirable-undesirable" characterization does not fit items in this section very well. Most of the items are concerned with whether physicians are receptive to suggestions and information from pharmacists. Perhaps it is realistic for students to have relatively low scores on these items.

8. Scores on attitudes concerning management of a pharmacy were generally high--usually over 3.50. These responses indicate that students think pharmacists should possess a wide variety of managerial skills.

9. Scores on attitudes concerning the pharmacist's responsibilities for drug use were all very high. None of the seven items had a pre- or post-test mean score lower than 4.17 on the five-point scale. This means that UMKC pharmacy students participating in the externship expressed strong and consistent attitudes emphasizing the pharmacist's ethical and professional responsibilities regarding the distribution of drugs, both before and after the externship. A good example is the item stating that "In my opinion the pharmacist must ensure that the prescription meets all the legal requirements", on which the 1979 pre- and post-test means were 4.67 and 4.63, respectively, with

standard deviations of only .57 and .49.

10. Scores on attitudes dealing with adequacy of preparation at the School of Pharmacy were generally high. Three of the six items had 1979 post-test means of 4.03 or higher. However, three of the items had post-test mean scores between the "Uncertain-neutral" category and the "Agree" category on the five-point scale. These three items were: "I feel adequately prepared to assume practice as a pharmacist in a hospital," "I feel adequately prepared to institute new programs (unit dose, I.V. admixtures, patient profiles, etc.) in a hospital pharmacy," and "I feel adequately prepared to analyze and change managerial operations (pharmacy department, store arrangement, buying policies, etc.) of a community pharmacy." Perhaps it is not surprising that scores on these three items were lower than on the other three items in this set, inasmuch as many of the students served either in community or hospital pharmacies. It is interesting to note that mean scores were higher on the item dealing with preparation to "assume practice as a pharmacist in a community pharmacy" than on the corresponding item dealing with hospital pharmacies, in accordance with the fact that more externships were served in community pharmacies than in hospital pharmacies.

11. Scores on attitudes dealing with the School of Pharmacy curriculum were slightly lower than was true for most other parts of the questionnaire. None of the 1979 pre- or post-test mean scores on the first four items with five response categories were above 3.55. However one also should recognize that:

a) these are global items which students could be expected to have some uncertainty in answering before they enter the profession, and b) the mean scores are still above the mid-point on the 5-point scale. In addition, it should be noted that a sizable majority of students said the curriculum had "the right amount" of emphasis (rather than too little or too much) on five of the last seven items with three response categories. The two items for which this was not true stated that "The curriculum of the School of Pharmacy contains enough course work in pharmacy management (law, marketing, management, etc.)" and "The curriculum of the School of Pharmacy contains enough course work in clinical pharmacy." For the former item, 25 respondents answered "Needs more"; for the latter item, 23 answered "Needs less."

Pre-post Differences on Items

In order to determine whether the externship experience may have been associated with a change in attitudes as indicated by the questionnaire, Wilcoxon Ranked-Signs Test values* were computed comparing the pre-externship and post-externship responses for the first 66 (ordinal) items on the questionnaire. Eighteen of the 66 items had pre-to-post difference scores which were significantly different at the .05 level of confidence or better (one-tailed test). This means that statistically significant changes in the attitudes of 1979 students occurred on 27 percent of the 66 items. However, it should be noted that

*The Wilcoxon Test is a nonparametric test used to determine whether there is a common distribution for paired ordinal variables. Both the signs and the magnitude of differences are used to compute the probability of a difference. See Sidney Siegel, Nonparametric Statistics for the Behavioral Sciences, New York: McGraw Hill, 1956, 75-83.

four of these changes were in an "undesirable" direction. (These four items were "Most OTC products are so clearly labeled with directions and indications that most patients do not need the pharmacist's advice"; "Patients who have been on maintenance Rx's for three months or more need not be advised about their Rx medications"; "I believe that the pharmacist should review the patient's medication record before filling the patient's prescription"; and "I believe the pharmacist must ensure that the patient understands the storage requirements for certain specific products.") It also should be noted that five of the "positive" changes occurred on the six-item set dealing with Adequacy of Preparation at the UMKC School of Pharmacy. A significant increase also was recorded on the curriculum item, "The School of Pharmacy curriculum is excellent preparation for the practice of pharmacy." These findings indicated that students felt better prepared to practice pharmacy after the externship than they did before.*

It should also be noted that scores on the three of the four curriculum items dealing with preparation for the practice of pharmacy in the future increased between the pre-test and the post-test, though only one of these differences attained significance at the .05 level. Even though these and other items dealing specifically with the School of Pharmacy curriculum did not show large gains between the pre-test and post-

*Last year's analysis for 1978 students showed twelve significant differences between pre- and post-test responses. Seven of these differences were on items for which significant differences also were found for 1979. Five of these seven differences were on Adequacy of Preparation items designated in Table 5, section 5.i. The remaining two were Patient-Pharmacist Relationship items "Most patients are quite willing to discuss their symptoms with the pharmacist" and "Most patients regard pharmacists as knowledgeable in regard to their medical problems."

test, it is encouraging to find that the majority of responses to this part of the questionnaire suggested positive perceptions of the curriculum, after students had been working one or two months at pharmacies in the field.

Finally, data for the last seven nominal-scaled items on the questionnaire also were analyzed to determine whether there was an interest in the percentage of students responding "the right amount" to these items dealing with the School of Pharmacy curriculum. Chi-squared tests indicated there was no statistically significant increase on any of these items.

Pre-post Differences on Scales

As shown in Table 6, scores on six of the twelve scales based on the factor analysis increased significantly from the pre-test to the post-test. These six scales were: Positive vs. Negative View of Patient Behavior Related to Pharmacists' Advice; Positive vs. Negative View of Physician Behavior with Respect to Drugs; Wide vs. Narrow Definition of Pharmacists' Managerial Responsibilities; Adequate vs. Inadequate Preparation at the School of Pharmacy; Adequate vs. Inadequate Preparation for a Hospital Pharmacy; and Adequate vs. Inadequate Preparation for Working Independently as a Pharmacist. In addition, scores on the scale Active vs. Passive Pharmacist Role in Dispensing Drugs significantly decreased. The increases which occurred in the three scales dealing with adequacy of preparation re-affirms the conclusion reported above that students felt better prepared to practice pharmacy after they had participated in the externships

TABLE 6

Pre and Post Test Mean Scores (Sum of Items) on the Factor Scale

Scale	Pre-Test Mean	S.D.	Post-Test Mean	S.D.	Post-Pre	p*
1. Positive vs. Negative Attitudes Toward Pharmacy as a Profession.	21.10	2.15	21.14	2.35	-.04	n.s.
2. Emphasis on Maintenance of Patient Medication Records.	11.84	1.70	11.82	2.03	-.02	n.s.
3. Positive vs. Negative Attitudes Regarding Pharmacist Behavior Concerning Over the Counter Drugs.	6.86	1.67	6.58	1.39	.28	n.s.
4. Pharmacist Role in Informing Patients About Rx Medications.	9.58	1.88	9.47	2.03	.09	n.s.
5. Positive vs. Negative View of Patient Behavior Related to Pharmacists' Advice.	24.07	2.63	23.24	2.87	.83	$< .05$
6. Positive vs. Negative View of Physician Behavior with Respect to Drugs.	15.47	2.43	14.19	2.59	1.28	$< .001$
7. Wide vs. Narrow Definition of Pharmacists' Managerial Responsibilities.	28.67	4.07	27.89	3.91	.78	$< .05$
8. Active vs. Passive Pharmacist Role in Dispensing Drugs.	30.81	2.75	31.52	2.82	-.71	$< .05$
9. Adequate vs. Inadequate Preparation at the School of Pharmacy.	19.53	3.08	18.02	3.82	1.49	$< .05$
10. Adequate vs. Inadequate Preparation for a Hospital Pharmacy.	6.86	2.28	6.27	2.35	.59	$< .001$
11. Adequate vs. Inadequate Preparation for Working Independently as a Pharmacist.	12.68	1.78	11.74	2.40	.94	$< .001$
12. Positive vs. Negative Views of the School of Pharmacy Curriculum.	13.66	2.52	13.08	3.33	.58	n.s.

*p values are one-tailed probabilities using the Wilcoxon Matched-Pairs Ranked-Signs Test.

than they had before.*

Sex Differences in Attitudes

To determine whether male and female students differed in their pre- and post-test responses to the attitude questionnaire, Kolmogorov-Smirnov (K-S) values** were computed to compare male and female responses to the individual items and the scales. On the pre-test, male and female responses differed at the .05 level (two-tailed probability) on only one of the first 66 items. (K-S values were not computed for the last seven items because response categories for these items were nominal rather than ordinal.) On the post-test, no sex difference was found on any of the 66 items. Chi-square tests used to compare male-female responses on the last seven (Curriculum) items also showed no significant differences. In addition, no sex differences were found on the twelve scales, either pre- or post-test. We conclude that males and females did not differ in their responses to the questionnaire.

Previous Experience and Attitudes

One section of the pre-test questionnaire asked respondents to indicate the number of hours they had worked in pharmacies (hospital pharmacies, independent community pharmacies, or chain

*A subsequent factor analysis combining items from the Adequacy of Preparation and Curriculum categories indicated that the first four items in the Curriculum category loaded on the same factor with items 1,2,4, and 6 in the Adequacy of Preparation category. This suggests that future studies could add these eight items together to constitute a new General Adequacy of Preparation factor, replacing two of the factors reported above (Adequate vs. Inadequate Preparation for Working Independently as a Pharmacist; Positive vs. Negative Views of the School of Pharmacy Curriculum) that incorporated the eight items in question.

**The Kolmogorov-Smirnov test examines the difference between two groups on an ordinal variable. It is designed to determine whether two samples have the same distribution of responses on the variable. See Siegel, op.cit., pp. 127-136.

community pharmacies) before the beginning of their externships. Responses were examined in conjunction with attitude scale-score responses to determine whether attitudes were related to previous experience. Pearson product-moment correlations indicated that total hours of previous experience in pharmacies and attitudes were related as follows, using the .05 level as the criterion for statistical significance:

Students with many hours of pre-externship total experience had lower pre-test scores than those with few hours of experience on "Positive vs. Negative View of Physician Behavior with Respect to Drugs." However, these two groups did not differ significantly on the post-test. Further examination of the data indicated that:

1. The difference in the scale scores was due largely to differences on the fifth item in the pre-test set dealing with physician-pharmacist relationships.

2. The difference was due primarily to the correlation between hours in a hospital pharmacy (rather than in an independent or chain community pharmacy) and attitudes on the item designated above. Students with many hours in a hospital pharmacy were more likely than those with few or no hours to strongly agree that physicians regard pharmacists' advice on treatment as an encroachment of their field of experience.

Students with many hours of pre-externship total experience had higher scores than those with few hours on both the pre- and post-test means for the first two of the scales dealing with adequacy of preparation at the School of Pharmacy. These scales are "Adequate vs. Inadequate Preparation at the School of Pharmacy," and "Adequate vs. Inadequate Preparation for a Hospital Pharmacy." Further examination of the data indicated that part of their overall differences arose as follows:

1. Students with many hours of experience in a hospital pharmacy were more likely than those with few or no hours to have high scores on both the pre- and the post-test administration of items 3 and 5 dealing with Adequacy of Preparation at the School of Pharmacy.

2. Students with many hours of experience in an independent community pharmacy were more likely than those with few or no hours to have high scores on the post-test administration of all seven items dealing with Adequacy of Preparation at the School of Pharmacy.

Students with many hours of pre-externship total experience had lower pre-test scores than those with little experience on the post-test administration of the scale "Positive vs. Negative Attitudes Toward Pharmacy as a Profession." However, these two groups did not differ significantly on the post-test. Further examination of the data indicated that:

1. The difference in the scale scores was due to differences on items 1,4, and 6 in the pre-test set dealing with pharmacy as a profession.

2. Students who had many hours of experience in a hospital pharmacy had lower scores (indicating strong disagreement) than those who had few or no hours on item 1 stating that the practice of pharmacy represents a high level of professional behavior.

3. Students who had many hours of experience in a chain community pharmacy had lower scores (strong disagreement) than those with few or no hours on item 6 stating that the practice of pharmacy is a profession in which one can use his/her education to help sick people.

Type of Externship and Attitudes

Data on the attitude questionnaire also enabled us to determine whether there were attitude differences between students who served externships only in hospitals and those who served only in community pharmacies. To do this, we compared the responses of students who

had served in one or two community pharmacies but no hospital pharmacies with the responses of students who had served in one or two hospital pharmacies and no community pharmacies. There were 40 students in the former category and 19 in the latter category.

Examination of K-S values for the scales indicated that there were no statistically significant differences between the two groups on either the pre- or post-test administrations of the questionnaire, except for the pre- and post-test scales dealing with Adequate vs. Inadequate Preparation for a Hospital Pharmacy. As one might expect, students who served in hospital externships had higher scores (i.e. stronger agreement) on the post-test administration of this scale than did not students who served only in community pharmacies ($p < .001$). However, the former group also had higher scores ($p < .001$) on the pre-test*, thus raising the question of whether the externship experience was responsible for part of the post-test difference. To examine this question, we computed gain scores on the scales dealing with adequacy of preparation for a hospital (post-test minus pre-test) and did a correlation analysis relating gain scores to previous hospital hours and externship weeks in hospital pharmacies. Partial correlations computed in this analysis showed that weeks in a hospital externship correlated at .43 with gains (i.e. increasing agreement) on the adequacy of preparation for a hospital pharmacy scale after controlling for previous hospital hours and pre-test

*This finding may not be surprising in view of the facts that there was a Pearson correlation of .46 ($p < .001$) between hospital hours before the externship and hospital weeks (0,4, or 8) during the externship and, as previously explained, hospital hours were significantly correlated ($r=.58$; $p < .001$) with both the pre-test and the post-test.

scores ($p < .001$). This result indicates that students who served in hospital externships felt better prepared to work in a hospital pharmacy as a result of these externship assignments.

PREFERENCE FOR RURAL OR SMALL CITY PRACTICE LOCATION

One of the items on the questionnaire asked respondents to indicate the type of community in which they would prefer to practice pharmacy after graduation. The item was worded as follows:

Rank one through four your preference as to the location in which you prefer to practice pharmacy. Place 1 by your 1st choice, 2 by your 2nd choice, etc.

_____ Rural (less than 30,000 population)
_____ Small City (30,000 - 72,000 population)
(examples: St. Joseph, Joplin, Jefferson City, Columbia)
_____ Metropolitan Areas (over 72,000 population)
(examples: Springfield, St. Louis, Kansas City)
_____ Suburban Areas (counties over 100,000 outside of metropolitan area; (examples: Clay, Jackson and Greene Counties in Missouri; Johnson County in Kansas)

The first step in our analysis was to determine whether demographic characteristics were associated with post-externship preference to locate in a rural area. Accordingly, we examined the relationships between age, sex, and type of community in which students were raised on the one hand and preference to locate in a rural community on the other. (One questionnaire item asked respondents to designate the size of the community "in which you were raised," using the same response categories as the location preference item.) Age was not related to preference for practicing pharmacy in a rural location but rural origins did seem to be related to rural practice preference. Distribution of students preferring to locate in a rural area by type of community in which they grew up was as follows:

Background	Number Preferring Rural	Number Preferring Small City, Suburban, or Metropolitan
Rural	8	12
Small City	1	8
Metropolitan	4	21
Suburban	2	8

These data indicate that students from rural areas are more likely to prefer practicing in rural areas than are students from other locations (Chi-square = 8.68; $p < .01$).

Distribution of students preferring to locate in a rural area by sex was as follows:

	Number Preferring Rural	Number Preferring Small City, Suburban, or Metropolitan
Male	10	31
Female	5	18

These data show there was little difference in the proportion of males and females who designated rural areas as their preferred location for practicing pharmacy.

The next step in our analysis was to determine whether demographic characteristics were related to selection of rural areas or small cities as preferred practice locations. Age was not related to choice of rural or small city location but rural origins did seem to be related to preference for rural or small city locations:

Background	Number Preferring Rural or Small City	Number Preferring Suburban or Metropolitan
Rural	12	8
Small City	4	5
Metropolitan	8	17
Suburban	3	7

These data indicate that students from rural areas are more likely to prefer to locate in rural areas or small cities as pharmacists than are students from small cities, metropolitan cities, and suburban areas (Chi-square = 5.98; $p < .05$).

Distribution of students preferring to locate in a rural area or small city by sex was as follows:

Sex	Number Preferring Rural	Number Preferring Suburban or Metropolitan
Male	20	21
Female	7	16

These data indicate that male students were more likely than female students to prefer to locate in rural areas or small cities after graduation (Chi-square = 6.52; $p < .05$). This difference in preference between males and females cannot be accounted for by a difference in rural vs. non-rual origins inasmuch as a smaller percentage of males (24%) than females (43%) came from rural areas.

Our next step in this part of the analysis was to examine the distribution of preference responses when students were categorized by origins and sex at the same time. The distribution of responses was as follows:

Background and Sex	Number Preferring Rural or Small City	Number Preferring Suburban or Metropolitan
Rural Male	8	2
Non-rural Male	12	19
Rural Female	4	6
Non-rural Female	3	10

These data indicate that rural males may be more likely than other students to prefer to practice in a rural or small city

location. This difference between the rural males and the remainder of the sample was statistically significant (Chi-square = 8.81; $p < .01$).

The next step in our analysis was to determine whether student background characteristics were associated with preference to practice in a rural area or a small city as first or second choice. To do this, we examined the distribution of students' responses indicating preference to practice in a rural area or a small city as their first or second choice. The results indicated that age was not related to preference for rural or small city practice location, but sex and origins were related to preference for rural or small city locations as first or second choice. As regards sex, 76% of the males as compared with 52% of the females selected rural or small city as their first or second choice (Chi-square = 9.03; $p < .01$). As regards origins, 86% of the students from rural areas or small cities as compared with 51% from metropolitan cities or suburban areas said they preferred to practice in rural areas or small cities as their first or second choice (Chi-square = 14.04; $p < .001$). When both origins and sex were taken into account at the same time, the distribution of responses was as follows:

Background and Sex	Number Preferring Rural or Small City	Number Preferring Suburban or Metropolitan
Rural or small city male	16	1
Metropolitan or suburban male	15	9
Rural or small city female	9	3
Metropolitan or suburban female	3	8

These responses indicate that male students from rural areas or small cities may be more willing than other pharmacy students--particularly metropolitan or suburban females--to practice in rural or small city locations. The difference between males from rural areas or small cities and other students was significant at the .01 level (Chi-square = 9.35).

Data also were available showing students' practice location preferences when the attitude pre-test was administered, before they participated in the externships. Analysis of these data along with the post-test data indicated that there was considerable change in preference responses during the eight weeks between the two test administrations. For example, there were six students who designated rural location as their first choice on the pre-test but did not designate rural locations as their first choice on the post-test. Conversely, four students who did not designate rural locations as their first choice on the pre-test did select rural locations first on the post-test. Three of the seven who switched from a rural to a non-rural location were students from rural areas.

A similar analysis was performed concerning choice of rural or small city locations for future practice. This analysis showed that eight students who designated rural or small city location as their pre-test preference did not designate these locations as their first choice on the post-test. Conversely, two students who did not designate rural or small city location as their first choice on the pre-test did select these locations first on the post-test. Four of the eight who switched from a rural or small city preference were students from rural areas. Evidently these

students found they were no longer as interested in practicing pharmacy in a rural area as they had been before their summer externship assignments.

OPEN-ENDED RESPONSES

Both the student and Teaching Associate evaluation questionnaires requested respondents to add comments and suggestions concerning their perceptions of the externships and problems which may have arisen in their own experience. This section describes a few of the comments which were made most frequently or pointed to considerations which may be worth special emphasis.

Competency of Teaching Associates

The most frequent type of comment which was added by the students involved ways in which the Teaching Associates had gone out of their way to make the externships a successful learning experience for the externs. These comments indicated that many of the Teaching Associates made a special effort to ensure that students had a good learning situation and participated in a variety of suitable activities. A few examples of this type of comment are quoted below:

Student #8: "In my case I had the pleasure of working with a highly qualified, talented pharmacist, which made this rotation very educational. This program expanded my education in retail pharmacy tremendously, filling in the gaps left by the school in retail education."

Student #24: "I enjoyed my four-week externship at _____. Every pharmacist there is talented and excited about pharmacy. They stay abreast on current pharmacy practice, and they demonstrated it. Each pharmacist was helpful and sharing with me."

Student #25: "I spent time with both pharmacists. _____ was extremely current in clinical information and was more bent on discussing clinical studies, etc. Many of the questions he asked were not answerable by consulting their available library. _____ taught me alot about how to improve patient care in the pharmacy, as well as his business practices and his views of the retail pharmacist in the future."

Student #29: "Special effort was made on the part of the pharmacy staff to allow me the opportunity to get out and around in the hospital and witness the activities within the hospital. I spent one morning with the psychiatric unit and their patients. I also had the opportunity to watch a cardiac cathecterization, a pulmonary function, a bronchoscopy, and much more."

Student #31: "_____ and _____ were good pharmacists to learn from. They are concerned with patient care and provide a good service to their community. _____ is a very smart man and really does wish to share his views with people. I felt very relaxed working with both of them."

Student #44: "_____ is an excellent R.Ph., and he has a great working relationship with the community. I feel that I learned alot from this man."

Student #60: "_____ gave me a very good introduction to the business end of pharmacy. I ordered, opened up, closed, checked out the cash register, and did the daily business reports. All in all I had a good time that was very educational. I know I was welcomed there and treated as an equal."

However, some of the students reported that their Teaching Associates did not provide much systematic help and/or placed them in a position which made it difficult to function appropriately in the externship. Several of these comments were as follows:

Student #11: "Although _____ is personable and easy to get along with, he is a very busy man. Because he is busy, many times I had to fend for myself, suggesting and finding things to do and learning many of the basic pharmacy duties from the pharmacists on duty."

Student #36: "At the site here it was kind of like they didn't know what to do with an extern... (Some of the time) I was left on my own to occupy myself."

It should be noted that School of Pharmacy staff administering the externship program were aware of these isolated cases of apparent dysfunctioning in the program and had already taken steps to avoid their recurrence before we began to prepare this evaluation report. In several cases, in fact, students were switched from one externship location to another before their full month assignment had been completed, because Teaching Associates had not provided adequate supervision or other problems made the learning experience unproductive for students. Thus there was evidence that student data were being used as on-going feedback information to improve the operation of the program during the 1978 assignments and in subsequent years.

It also should be noted that problems involving the Teaching Associates and other aspects of the program were connected with the relatively high number of externships (138) which were arranged during the summer of 1979. Providing this number of externships in so short a time strained available resources in the WMAHEC region and made it necessary to include several pharmacies and Teaching Associates who otherwise might not have been asked to participate. Related to this, several students expressed dissatisfaction with

serving in pharmacies in which there was relatively little business to conduct. This latter problem appeared in some cases to arise in part from a tendency for summer months to be very "slow" in many retail pharmacies. These considerations suggest that the possibility of re-arranging the School of Pharmacy curriculum to allow for the scheduling of externships earlier in the senior year should be explored by the faculty and administration.

Variety of Learning Experiences

Many of the students' comments explicitly described the wide variety of learning opportunities which had been available to them as part of their externships. A few of these types of comments are quoted below:

Student #5: "I feel this experience was good in allowing me to get involved in functions of a pharmacist at a hospital. We were able to see a cardiac cath., an angiogram, the premature infant nursery, and a myelogram. As far as the pharmacy, I learned how a computer system can be set up to facilitate patient care and also was able to get more experience in the preparation of hyperalimentation."

Student #9: "I feel the externship program gave me an opportunity to view pharmacy in a different light. I saw the day-in, day-out work in a hospital setting and became involved in management-level duties. The two-month stay gave me a very good understanding of small hospital operations and a view of corporate pharmacy services."

Student #11: "The past eight weeks have done much to develop my independence and increase my pharmacy self-image and confidence. Experiences included:

1. Nuclear medicine preparation, use, and diagnosis of results.
2. CAT scan pprn. and dx results.

3. Gastroenterology.
4. Special procedures - e.g. renal arteriography.
5. One week at a sister hospital seeing:
   a. mental patients.
   b. alcoholic patients.
6. Dispensing.
7. Respiratory Therapy.
8. Plus much more."

Student #13: "Some of my experiences included:

1. Seven days of outpatient Rx work.
2. Ten days of inpatient Rx work.
3. Teaching a pharmacology class to the technicians.
4. Drug comparisons for the P&T Committee.
5. Answering drug information questions.
6. Rounded with physicians.
7. Conducted nursery in-service programs.
8. Conducted diabetic consultations."

Student #15: "Overall this was a very worthwhile experience. I was able to see and use the CAPS system in actual practice. One of its greatest values lies in its capacity to automatically update prices and thus enable the pharmacy to maintain its regular markup. Further, I was involved in the early stages of a unit dose system for supplying a nursing home and was able to participate in two weekly nursing inspections. These inspections included checking to make sure medicines were given properly and whether there were any drug interactions in the medication regimes of any of the patients."

Student #20: "At this site I was given an opportunity to be in action in several departments and I didn't even have to ask!! The departments were:

Emergency Room
Intensive Care
Physical Therapy".
Nutrition Committee Board
Respiratory Therapy

Student #64: "I think the externship program is great. The experience in real life situations is invaluable. I've probably learned more than I did in alot of the courses we've had in school. I remember more when I've actually used information. Pharmacy was great. Everybody accepted me pretty well and everybody always had time to stop and chat.

> The McPike computer they had also was an invaluable experience. When I first thought about computers in a pharmacy, I thought I would never be able to run one. I've found it's great. It saves time, has all that info stored up for you right under your fingertips. I've forgotten how to go back to the old conventional way."

However, as we mentioned above, a few students were in locations in which Teaching Associates did little to provide a range of appropriate experiences or slow business conditions reduced opportunities for participating in a variety of activities. In addition, several students who had a great deal of experience in pharmacies prior to their externships indicated that a significant share of their externship activities duplicated this prior experience. These comments indicated that more should be done, if possible, to make sure that externship assignments do not duplicate opportunities that students already have had while working in pharmacies.

Knowledge of Non-clinical Aspects of Pharmacy

As indicated in our earlier analysis of externship evaluation forms, students generally felt they had gained a great deal of knowledge of non-clinical aspects of pharmacy such as business management and the community setting for pharmacy. Comments along these lines were written in by many of the students and are illustrated in the following quotations.

> Student #21: "This was an excellent experience for me. It really helped me to see what a lot of the book work means. Also by being in the community a few days a week, I could get into the community better."

Student #22: "The externship experience provides the student with an opportunity to experience the practice of pharmacy outside the classroom. I feel it was of great benefit to me to experience hospital pharmacy in other than a unit-dose system. _____ provided me with excellent instruction on many facets of the practice of pharmacy, purchasing of drugs, inventory control, federal and state laws, drug selection, formulation of policies and procedures, and management of personnel."

Student #34: "I feel the externship program is helpful - especially for people who have had little pharmacy experience. It was also helpful for me in that it got me back into the "real world" where the pharmacist encounters problems which are never encountered in school. In my second assignment, I was able to do much more work in the front end. I found this to be very helpful in that you have to deal a lot with problems that are non-prescription related."

Student #41: "I spent a lot of time talking with the preceptor about managerial policies and talked quite a bit about drug-related problems. _____ is involved outside of the pharmacy with community affairs committees. We talked quite a bit about his role as a pharmacist in the community and how he was involved with these various committees."

Student #42: "It was good to have the opportunity to try some of the things I had learned in school in a practical situation...I learned many things and saw many things a pharmacy student does not often see first hand. It was a very beneficial experience."

Student #47: "I learned more here than I have felt I learned in school. Mostly this was due to being allowed to attend morning conferences and go on rounds with the medical students."

Student #56: "I have thoroughly enjoyed my experience. As usual, you get back what you put into an experience. I have worked hard to get on a personal basis with my patients and have been successful. Now I am working in development of a drug information center for the community. I love my role as a community pharmacist."

Continuing Education of Teaching Associates

One of the goals of the externship program is to help provide up-to-date information to practicing pharmacists in the WMAHEC region. By maintaining contact between Teaching Associates and the UMKC School of Pharmacy and its students, it is hoped that the externships can be valuable to the Associates as well as the externs. That this goal was being attained in at least some cases was clear from the comments of a few students who indicated that pharmacists and others with whom they worked during their externships were receptive and sometimes even eager to learn about new techniques and ideas being taught at the School of Pharmacy. For example, one student said that "The working relationship I had with the personnel at _____ Pharmacy went beyond my expectations. The pharmacists accepted me as their equal and often looked to me as a source of quick information they had long ago forgotten," and another said that "_____ gave me free rein of the pharmacy and accepted many of my ideas. Anytime _____ had a professional question from a patient, he would consult me first and get my views, then answer the patient. This was to ensure he was up-to-date on the current therapies."

However, only a few of the students volunteered this type of comment, and since we did not explicitly inquire about this aspect of the externship on the questionnaire, we do not know how well continuing education goals were attained in most of the externships. Therefore, we believe that this issue should receive more direct attention on next year's questionnaire. We also think, based partly on discussions at the School of Pharmacy, that it would be desirable

to conduct a short meeting or seminar for Teaching Associates, to discuss the excellent continuing education materials which the School already sends to Associates in conjunction with the externship program.

SUMMARY AND RECOMMENDATIONS

The first section of this report presented data indicating that the School of Pharmacy attained its participation goals with respect to the externship program and that both the externs and the Teaching Associates were generally positive about the value of the experience and the performance of the students. Data also were presented describing students' pre- and post-externship responses to a 73-item attitude questionnaire developed by faculty of the School of Pharmacy. These data indicated that student responses generally were in the "positive" or "desirable" direction both before and after the externship, and that the externship contributed to an enhanced perceptions among students that they had been well prepared for the practice of pharmacy.

Student and Teaching Associate open-ended comments on the questionnaires as well as interviews at the School of Pharmacy indicated that many of the students felt the Teaching Associates went out of their way to provide a wide range of beneficial learning experiences. However, these comments also suggested that there are occasional problems in carrying out the program, and that the following steps should be pursued in working to further reduce or eliminate such problems:

1. Explore the possibility of scheduling externships earlier in the year.
2. Conduct a seminar for Teaching Associates, in order to build further on continuing education materials already provided as part of the externship program.