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AUTHOR Drake, Miriam A.
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ABSTRACT

A study of the Purdue University Libraries was conducted to help allocate costs by user group and academic department. A circulation survey was taken to determine user identification. The sampling included reserve material used in the library, materials borrowed overnight or longer, and use of photocopy service. Copies of transaction cards were made and sent to data processing to be categorized by level, department, and library location. Results of the study were compiled in six statistical tables which indicate the number of loans by location, level of user, and school and department. (Author/DS)

CIRCULATION OF MATERIALS FROM PURDUE UNIVERSITY LIBRARIES

By

Miriam A. Drake

RDU 75-06

Research Development Unit
Purdue University
Libraries and Audio-Visual Center
West Lafayette, Indiana

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INTRODUCTION

In March 1974, the Research Development Unit (RDU) began a cost allocation study of the Purdue Libraries and Audio-Visual Center. The objectives of the study are to: 1) ascertain the costs of providing library and audio-visual services and materials to the West Lafayette campus; 2) allocate costs by user group and academic department; and 3) allocate costs by library function. The second objective, allocation of library costs by user group, is the subject of this report. A final report for the entire study will be issued later in the year. Allocation data for the Audio-Visual Center will be included in the final report.

Before library costs could be allocated by user group and academic department it was necessary to determine the users of the Purdue Libraries. Data on user identification was not readily available; therefore, a circulation survey was undertaken. The survey was conducted during the busiest three months of second semester, February 1 through April 30, 1975.

METHODOLOGY

Since Purdue's library circulation systems are manual it was not feasible to include every library transaction in the survey. Individuals collecting data were asked to include materials borrowed for overnight or longer in the sample. In addition, libraries which offer photocopy service were asked to report their photocopy activity for the sample period. In-library use of materials, Bookstall, and reserve materials were excluded from the study due to the difficulty and expense of data collection. It is assumed that reserve book usage is highest among people involved with courses for which the books are reserved. It has been suggested that over-the-counter circulation counts are poor indicators of library usage. One study has shown that there is a high positive correlation between books used inside and outside the library. McGrath, in his study, concluded that total library usage could be estimated from over-the-counter loan records for both subjects used and department of borrower.*

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*William E. McGrath. "Correlating the Subjects of Books Taken Out of and Books Used Within an Open-Stack Library." College and Research Libraries, July 1971.

Two libraries, General and Krannert, use a multi-part key sort transaction card for library loans. Copies of transaction cards were sent to the Research Development Unit after materials were returned to the library. The sample period for these libraries was extended one week in order to gather data on semester loans and other materials which were charged out before April 30 but returned before May 6.

Other Purdue libraries use a book card, on which the borrower signs his/her name, for circulation control. Duplication of these cards was precluded by time, convenience, and expense. In addition, book cards generally do not contain sufficient data to fully identify the borrower. Special forms and imprinters to be used for data collection were issued to libraries using book cards. These forms, which were precoded for location, were sent to the Research Development Unit weekly during the study.

All libraries were instructed to ask every borrower for a passport (if Purdue student) or other means of identification, such as staff card, bursar's receipt, etc. All passports were imprinted on forms. Borrowers associated with Purdue but not in possession of a passport, were asked to present other identification and to give their status (faculty, student, staff) and department. These data were recorded on transaction cards or forms. There were two classes of borrowers not associated with Purdue; general public and interlibrary loan users. Public borrowers using the libraries were classified as "other". Interlibrary loans were classified separately by library location.

Identification of borrowers at each location was the prime purpose of the circulation survey; however, questions had been raised regarding the subject areas of materials borrowed by different groups from specific libraries. For example, it would be of interest to know how many Industrial Engineering students were using the Mathematical Sciences library for books on statistics. In order to answer these questions, libraries were asked to record the Dewey class number up to two places beyond the decimal point on forms to be included in the sample.

When forms were received by RDU a notation was made on a master control list to indicate that forms had been received for the specific library and week. In addition, each packet of forms was given a batch number which was used to maintain control between RDU and keypunching. Forms were examined for errors, presence of social security number or other means of identifying the borrower and presence of Dewey class numbers. After editing, forms were sent to keypunching.

The completed punched cards were sent to the Administrative Data Processing Center for processing. Social security numbers, which were punched from passport data, were matched against files from the Registrar's Office and Personnel Office to determine the status and department of the borrower. When a match could not be made, the transaction was labeled "error" and excluded from the final tabulation. All records containing social security number in RDU's files were destroyed to protect the privacy of individuals. Data were summed by level, department, and library location.

FINDINGS

The survey sample includes 100,240 items loaned directly from 23 libraries and 4361 photocopied items made by 8 libraries.. The General library circulated 48.6% of the items in the sample (Table 1). It was believed that this figure was somewhat inflated because items which are part of school and departmental collections are stored in the attic of the General library and the 9th Street Warehouse and are charged out through the General library. Statistics maintained by the circulation staff indicate that approximately 85 items, less than 1% of General's total for the period, circulated from the General library were items from school and departmental collections.

Circulation in the school and departmental libraries ranged by 6460 items (6.2%) in the Krannert library to 63 items (.1%) in the Agricultural Engineering library. There were 13 libraries with less than 2000 items circulated. This group includes 4 egineering libraries which are scheduled for consolidation and 4 libraries associated with the School of Agriculture. The latter 4 libraries together circulated 2768 items during the survey period. Photocopies provided by Biochemistry represented 18% of the total circulation of the 4 libraries and 52% of the loans made from the Biochemistry library.

Undergraduates charged out the greatest number of items while graduate students received the greatest number of photocopies (Table 2). The

General library loaned the greatest proportion of items to each group on the campus (Tables 3 and 3A). Libraries receiving greatest use by faculty were General (38.1%), Chemistry (8.8%), Mathematical Sciences (8.8%), and Krannert (7.7%). The patterns of library use were similar for graduate students except that they used the Psychology library more heavily than the faculty. Undergraduates used General (62.2%), Home Economics (7.5%), and Life Science (5.2%) most heavily.

Interlibrary loans during the sample period were more evenly distributed throughout the system. Lending was greatest from General (19.0%), Life Science (13.4%), Pharmacy (12.0%), and Veterinary Medicine (11.3%). This distribution is not surprising in view of the specialized nature of these collections and their uniqueness in the State.

Purdue students and faculty borrowed 87.1% of items included in the sample (Table 4). Usage by School ranks as follows:

1.	Humanities, Social Science, and Education	33.0%
2.	Science	15.6%
3.	Engineering	11.8%
4.	Agriculture	8.2%
5.	Home Economics	7.7%
6.	Industrial Administration	5.3%
7.	Technology	2.6%
8.	Pharmacy	2.1%
9.	Veterinary Medicine	.8%

Circulation by school provides only a gross indication of usage among different disciplines and users. More meaningful information can

be derived by combining circulation and population data to produce per capita usage and distributions of usage compared to population (Tables 5.1, 5.2, 5A.1, 5A.2, 6.1 and 6.2). The figures below were calculated on the basis of head count data provided by the Registrar's Office for second semester and the University Personnel Office.

Per Capita Loans by School

School	Faculty		Graduate Student		Undergraduate	
	Per Capita Loans	Rank	Per Capita Loans	Rank	Per Capita Loans	Rank
Agriculture	3.2	7	5.2	9	1.6	4
Engineering	4.6	5	6.5	7	1.3	6
Home Economics	3.0	8	10.0	1	3.5	2
Humanities, Social Science & Education	7.1	2	8.5	5	3.9	1
Industrial Admin.	5.1	4	5.7	8	1.4	5
Pharmacy	5.5	3	9.0	4	.9	8
Science	7.3	1	8.4	6	2.2	3
Technology	1.0	9	9.5	3	1.3	7
Veterinary Medicine	3.8	6	9.9	2	0	9
Total	5.2	-	7.7	-	2.1	-

Per capita loans to faculty were greatest in Science; Humanities, Social Sciences, and Education (HSSE); and Pharmacy. Graduate student use was greatest in Home Economics, Veterinary Medicine, and Technology, with HSSE ranking fifth. Undergraduate use was greatest in HSSE, Home Economics, and Science. Library usage in relation to population can be seen by comparing the percentage distribution of loans and population

for each population group. Tables 5A.1 and 5A.2 show the percentage distribution for schools and department.

Distribution of Library Loans and
Population Groups--West Lafayette Campus

School	Faculty		Graduate Student		Undergraduate	
	% of Population	% of Loans	% of Population	% of Loans	% of Population	% of Loans
Agriculture	19.9	12.3	9.5	6.4	15.0	11.4
Engineering	16.1	14.1	18.2	15.4	19.9	11.7
Home Economics	3.8	2.2	4.4	5.7	7.9	13.1
Humanities, Social Science & Education	25.0	34.3	36.7	40.6	19.7	36.4
Industrial Administration	3.7	3.6	7.6	5.6	11.1	7.2
Pharmacy	3.7	3.9	2.8	3.3	3.3	1.3
Science	18.6	26.0	18.7	20.3	13.5	13.8
Technology	5.8	1.1	.9	1.1	8.3	5.1
Veterinary Medicine	3.4	2.5	1.2	1.6	1.3	0
Total	100.0	100.0	100.0	100.0	100.0	100.0

ALLOCATION METHODS

The cost study will utilize two methods to allocate library costs. The first method will divide library costs into two general categories; processing and service. Processing costs are all costs associated with the purchase decision, order, receipt, classification, cataloging, and marking of materials. Under this technique, the cost and number of materials purchased are determined for each department fund. The processing cost is then divided among the departments on a unit basis.

$$P_i = M_i + T_i$$

where P_i = total processing and material cost for any department

M_i = cost of materials for the department

T_i = processing costs

$$T_i = \frac{A_i}{A}(C_1) + \frac{D_i}{D}(C_2)$$

where A_i = number of items purchased for the department

A = total number of items purchased

C_1 = acquisitions costs

D_i = number of items cataloged for the department

D = total number of items cataloged

C_2 = cost of cataloging, classification, marking, etc.

Acquisitions and cataloging costs will be further subdivided into serials and monographs.

The costs of providing service to library users is not expected to be uniform throughout the system. Service costs which are allocated to user groups will vary among libraries in proportion to space, equipment, staffing, etc. The cost of operating public facilities, reference, circulation and other services is determined and allocated on the basis of recorded circulation. In order to determine average costs for library system services to a department the following formula will be used:

$$S_i = \frac{X_i}{X}(Y)$$

where S_i = service cost for a department

X_i = number of loans by faculty and students in the department

X = total number of loans

Y = total service costs

This formula does not account for the differences in operating costs among the school and departmental libraries; therefore, a separate allocation will be made for each department's use of each library location. These costs will be summed to show the total cost of providing services to each department.

$$S_1 = \frac{u_{1.1}}{U_1}(L_1) + \frac{u_{1.2}}{U_2}(L_2) + \ldots \frac{u_{1.23}}{U_{23}}(L_{23})$$

where S_1 = cost of providing service to one department

$u_{1.1}$ = number of loans to users in one department from library 1

U_1 = total loans from library 1

L_1 = operating costs of library 1

$u_{1.2}$ = number of loans to users in one department from library 2

U_2 = total loans in library 2

L_2 = operating cost of library 2

The two elements of processing and service are combined to give a total cost for providing materials and service to a department

$$L_i = T_i + S_i \text{ or } L_i = T_i + S_1$$

where L_i = total costs of library service to a department

The second allocation method combines all costs associated with the libraries and attributes them to departments on the basis of usage. The gross allocation percentages are in the last column of Table 4. After costs have been attributed to specific departments both techniques further subdivide costs on the basis of usage by level. For example, if the total cost of operating the libraries were $1,000,000, 5.3% or $53,000 would be attributed to the School of Industrial Administration. This cost would be further attributed as follows:

Faculty	6.6%	$ 3,498
Graduate Students	37.8%	20,034
Undergraduates	55.6%	39,468
Total	100.0%	$53,000

The allocation of faculty usage to instructional programs will be made by the Office of Analytic Studies.

RECOMMENDATIONS

The circulation study has fulfilled its primary objective of providing data on which to base the allocation of library costs. The basic data has been preserved on magnetic tape providing a data base for further analysis.

Each departmental or school librarian has received a printout showing usage of appropriate libraries and departments. These data need further analysis to show travel patterns by borrowers on the campus. It is suggested that Industrial Engineering students be invited to analyze the data from a logistics point of view. This type of study could yield information which could be used in future considerations of new facilities or combined collections.

Further consideration should be given to consolidation of collections from which circulation is small. For example, small collections in Agriculture, such as Forestry-Horticulture, Entomology, Biochemistry, and Agricultural Engineering are maintained in four separate facilities. Each library circulates a small number of items.

Additional study should be given to the use of materials in special subject areas. The circulation study indicated that libraries such as Mathematics and Psychology, are serving substantial number of students and faculty from outside their home departments. The Dewey class numbers of materials used by outsiders should be analyzed to determine their

general subject areas, and the extent of use by the home department and outsiders. Duplication of heavily used items through departmental or other funding should be considered where appropriate.

There are two important circulation data needs which were not satisfied by this study. The first need is the determination of the number of individual users relative to the population. At present, there is no convenient method of estimating the number of individual faculty members or students who actually use the library and the number who do not use the library. This data would be useful in planning future library services.

The second information need relates to the distribution of loans of material in each location. Specifically, a study should be undertaken to determine the number of books and journals which actually circulate, the number of times each piece is loaned and the proportion of each collection which is seldom or never used. This data would provide the basis for weeding collections and facilities planning.

Table 1

Research Development Unit

Circulation Study

Loans by Location

Library	Number of loans	Number of items photocopied	Total loans*	% of Total
General	50,868	0	50,868	48.6
Krannert	6,460	0	6,460	6.2
Life Science	5,831	141	5,972	5.7
Chemistry	2,927	2,447	5,374	5.1
Psychology	5,214	0	5,214	5.0
Home Economics	4,946	0	4,946	4.7
Mathematical Sciences	3,814	78	3,892	3.7
Pharmacy	2,133	690	2,823	2.7
Aero, Astro, & Ind. Engrg.	2,239	0	2,239	2.1
Electrical Engrg.	2,097	29	2,126	2.0
Civil Engrg.	1,967	0	1,967	1.9
Physics	1,802	141	1,943	1.9
Veterinary Medicine	1,553	326	1,879	1.8
Mechanical Engrg.	1,637	0	1,637	1.6
Chemical Engrg. & Materials Science Engrg.	1,595	0	1,595	1.5
Forestry-Horticulture	1,506	0	1,506	1.4
Geosciences	1,409	0	1,409	1.4
Biochemistry	469	509	978	.9
Philosophy-Political Science	638	0	638	.6
Nuclear Engrg.	466	0	466	.5
Aviation Technology	385	0	385	.4
Entomology	221	0	221	.2
Agricultural Engrg.	63	0	63	.1
Total	100,240	4,361	104,601	100.0

*Includes photocopied items in Biochemistry, Chemistry, Electrical Engineering, Life Science, Mathematical Science, Pharmacy, Physics, and Veterinary Medicine. Loans for libraries will self service photocopy equipment is understated due to lack of data on number of items photocopied by users.

Table 2

Research Development Unit

Circulation Study

Loans by Level of User

Level	Number of loans	Number of items photocopied	Total loans	% of total
Faculty	9,522	1,235	10,757	10.3
Graduate Students	35,860	2,182	38,042	36.4
Undergraduates	43,567	140	43,707	41.8
Purdue University Staff	3,759	239	3,998	3.8
Interlibrary Loan	2,002	449	2,451	2.3
Other	5,530	116	5,646	5.4
Total	100,240	4,361	104,601	100.0

Table 3

Research Development Unit

Circulation Study

Loans by Location and Level[1]

Library	Faculty		Graduate Students		Undergraduates		Interlibrary Loans	
	Number of loans	% of total	Number of loans	% of total	Number of loans	% of total	Number of loans	% of total
Aero, Astro, & Industrial Enrgr.	257	2.3	895	2.3	630	1.4	121	4.9
Agricultural Engrg.	15	.2	27	.1	11	(2)	0	0
Aviation Technology	29	.3	1	(2)	337	.8	4	.2
Biochemistry	249	2.3	216	.6	37	.1	21	.9
Chemistry	948	8.8	3,376	8.9	643	1.5	39	1.6
Chemical Engrg. and Materials Science Engrg.	193	1.8	885	2.3	308	.7	111	4.5
Civil Engrg.	105	1.0	811	2.1	777	1.8	56	2.3
Electrical Engrg.	342	3.2	1,134	3.0	404	.9	80	3.3
Entomology	40	.4	36	.1	125	.3	8	.3
Forestry-Horticulture	89	.8	224	.6	1,078	2.5	60	2.5
General[3]	4,099	38.1	14,756	38.8	27,193	62.2	466	19.0
Geosciences	250	2.3	332	.9	425	1.0	43	1.8
Home Economics	262	2.4	981	2.6	3,287	7.5	99	4.0
Krannert	826	7.7	3,303	8.7	1,681	3.9	187	7.6
Life Science	583	5.4	2,076	5.4	2,276	5.2	329	13.4
Mathematical Sciences	943	8.8	1,848	4.8	738	1.7	76	3.1
Mechanical Engrg.	144	1.3	722	1.9	573	1.3	60	2.5
Nuclear Engrg.	26	.2	244	.6	151	.3	6	.2
Pharmacy	383	3.6	1,201	3.2	699	1.6	294	12.0
Philosophy-Political Science	105	1.0	369	1.0	111	.2	6	.2
Physics	248	2.3	1,116	2.9	349	.8	39	1.6
Psychology	320	3.0	2,768	7.3	1,650	3.8	69	2.8
Veterinary Medicine	301	2.8	721	1.9	224	.5	277	11.3
Total	10,757	100.0	38,042	100.0	43,707	100.0	2,451	100.0

(1) Includes photocopied items in Biochemistry, Chemistry, Electrical Engineering, Life Science, Mathematical Sciences, Pharmacy, Physics, and Veterinary Medicine.

(2) Less than .1%

(3) Includes loans of departmental library material stored in the attice or warehouse

Table 3A

Research Development Unit

Circulation Study

Percent Distribution of Loans to

Purdue User Groups by Location

Library	Loans to Purdue Users[1]	Percent Distribution		
		Faculty	Graduate Students	Under-Graduates
Aero, Astro, & Industrial Engrg.	1,782	14.4	50.2	35.4
Agricultural Engrg.	53	28.3	50.9	20.8
Aviation Technology	367	7.9	.3	91.8
Biochemistry	502	49.6	43.0	7.4
Chemistry	4,967	19.1	68.0	12.9
Chemical Engrg. and Materials Science Engrg.	1,386	13.9	63.9	22.2
Civil Engrg.	1,693	6.2	47.9	45.9
Electrical Engrg.	1,880	18.2	60.3	21.5
Entomology	201	19.9	17.9	62.2
Forestry-Horticulture	1,391	6.4	16.1	77.5
General[2]	46,048	8.9	32.0	59.1
Geosciences	1,007	24.8	33.0	42.2
Home Economics	4,530	5.8	21.6	72.6
Krannert	5,810	14.2	56.9	28.9
Life Science	4,935	11.8	42.1	46.1
Mathematical Sciences	3,529	26.7	52.4	20.9
Mechanical Engrg.	1,439	10.0	50.2	39.8
Nuclear Engrg.	421	6.2	57.9	35.9
Pharmacy	2,283	16.8	52.6	30.6
Philosophy-Political Science	585	17.9	63.1	19.0
Physics	1,713	14.5	65.1	20.4
Psychology	4,738	6.8	58.4	34.8
Veterinary Medicine	1,246	24.1	57.9	18.0
Total	92,506	11.6	41.1	47.3

(1) Includes photocopied items.

(2) Includes loans of departmental library material stored in the attic and warehouse.

Table 4.1

Research Development Unit

Circulation Study

Loans to Faculty and Students

By School and Department

School/Department	Number of loans	Number of items photocopied	Total loans[a]	% of total
Agriculture-Administration	2,171	1	2,172	2.1
Agricultural Economics	1,175	0	1,175	1.1
Agricultural Engineering	131	0	131	.1
Agronomy	696	0	696	.7
Animal Sciences	568	0	568	.5
Biochemistry	461	149	610	.6
Botany & Plant Pathology	422	0	422	.4
Entomology	404	29	433	.4
Forestry & Natural Resources	1,556	0	1,556	1.5
Horticulture	775	54	829	.8
Total	8,359	233	8,592	8.2
Engineering-Administration	94	0	94	.1
Aero and Astro Engrg.	1,121	0	1,121	1.1
Chemical Engrg.	1,086	33	1,119	1.1
Civil Engrg.	2,212	0	2,212	2.1
Electrical Engrg.	2,393	27	2,420	2.3
Freshman Engrg.	1,230	0	1,230	1.2
Industrial Engrg.	854	0	854	.8
Mechanical Engrg.	1,976	13	1,989	1.9
Materials Science Engrg.	297	25	322	.3
Nuclear Engrg.	483	3	486	.5
Interdisciplinary Engrg.	462	0	462	.4
Total	12,208	101	12,309	11.8
Home Economics-Administration	2,245	0	2,245	2.2
Clothing and Textiles	1,503	0	1,503	1.4
Housing, Equipment and Environment	947	0	947	.9
Foods & Nutrition	1,419	0	1,419	1.4
Home Management and Family Economics	462	1	463	.4
Restaurant & Hotel Management	428	0	428	.4
Child Development and Family Life	1,009	0	1,009	1.0
Total	8,013	1	8,014	7.7

[a] Includes photocopied items.

Table 4.2

Research Development Unit

Circulation Study

Loans to Faculty and Students

By School and Department

School/Department	Number of loans	Number of items photocopied	Total loans[a]	% of total
HSSE-Administration	1,082	0	1,082	1.0
Creative Arts	2,444	0	2,444	2.3
Audiology & Speech Sciences	1,136	0	1,136	1.1
Education	5,363	0	5,363	5.1
English	4,641	0	4,641	4.4
General Studies	21	0	21	*
History	2,676	0	2,676	2.6
Foreign Language and Literature	3,046	0	3,046	2.9
Philosophy	690	0	690	.7
Physical Education-Men	970	0	970	.9
Physical Education-Women	828	0	828	.8
Political Science	2,770	0	2.770	2.7
Psychological Science	4,041	0	4,041	3.9
Sociology and Anthropology	2,209	0	2,209	2.1
Communication	2,583	0	2,583	2.5
American Studies	17	0	17	*
Total	34,517	0	34,517	33.0
Industrial Administration	5,584	9	5,593	5.3
Pharmacy-Administration	458	115	573	.5
Bionucleonics	357	50	407	.4
Medicinal Chemistry and Pharmacognosy	270	248	518	.5
Pharmacology and Toxicology	237	46	283	.3
Clinical Pharmacy	64	42	106	.1
Industrial and Physical Pharmacy	192	130	322	.3
Total	1,578	631	2,209	2.1
Science-Administration	740	0	740	.7
Biological Sciences	3,476	34	3,510	3.3
Chemistry	2,789	2,410	5,199	5.0
Mathematical Sciences	2,691	52	2,743	2.6
Physics	1,547	20	1,567	1.5
Geosciences	1,012	4	1,016	1.0
Computer Sciences	999	12	1,011	1.0
Statistics	497	0	497	.5
Total	13,751	2,532	16,283	15.6

[a] Includes photocopied items.

*Less than .1%

Table 4.3

Research Development Unit.

Circulation Study

Loans to Faculty and Students

By School and Department

School/Department	Number of loans	Number of items photocopied	Total loans[a]	% of total
Veterinary Medicine-Administration	414	15	429	.4
Veterinary Anatomy	88	1	89	.1
Veterinary, Microbiology, Pathology & Public Health	220	33	253	.2
Veterinary Physiology and Pharmacology	28	1	29	*
Animal Clinics	53	0	53	.1
Total	803	50	853	.8
Aviation Technology	475	0	475	.5
Construction Technology	105	0	105	.1
Electrical Technology	230	0	230	.2
Industrial Education	654	0	654	.6
Manufacturing Technology	327	0	327	.3
Nursing	786	0	786	.7
Supervision Technology	154	0	154	.2
Total	2,731	0	2,731	2.6
Subtotal	87,544	3,557	91,101	87.1
Other Purdue	5,164	239	5,403	5.2
Interlibrary Loan and Other	7,532	565	8,097	7.7
Total	100,240	4,361	104,601	100.0

[a]Includes photocopied items.

*Less than .1%

Table 5.1

Research Development Unit

Circulation Study

Distribution of Loans to Faculty and Students

By School and Department(1)

School/Department	Faculty		Graduate Students		Undergraduates	
	Number of loans	% of total	Number of loans	% of total	Number of loans	% of total
Agriculture-Administration	19	.2	53	.1	2,100	4.9
Agricultural Economics	349	3.4	635	1.7	191	.4
Agricultural Engrg.	17	.2	55	.2	59	.1
Agronomy	78	.8	492	1.3	126	.3
Animal Sciences	87	.8	173	.5	308	.7
Biochemistry	231	2.2	262	.7	117	.3
Botany & Plant Pathology	120	1.2	256	.7	46	.1
Entomology	105	1.0	155	.4	173	.4
Forestry & Natural Resources	131	1.3	190	.5	1,235	2.9
Horticulture	125	1.2	131	.3	573	1.3
Total	1,262	12.3	2,402	6.4	4,928	11.4
Engineering-Administration	93	.9	1	*	0	0
Aero and Astro Engrg.	175	1.7	526	1.4	420	1.0
Chemical Engrg.	135	1.3	698	1.9	286	.7
Civil Engrg.	257	2.5	1,201	3.2	754	1.7
Electrical Engrg.	360	3.5	1,349	3.6	711	1.6
Freshman Engrg.	11	.1	0	0	1,219	2.8
Industrial Engrg.	77	.8	466	1.2	311	.7
Mechanical Engrg.	247	2.4	979	2.6	763	1.8
Materials Science Engrg.	65	.6	148	.4	109	.3
Nuclear Engrg.	31	.3	419	1.1	0	0
Interdisciplinary Engrg.	5	*	2	*	491	1.4
Total	1,456	14.1	5,789	15.4	5,064	11.7
Home Economics-Administration	6	*	1	*	2,238	5.2
Clothing and Textiles	37	.4	272	.7	1,194	2.8
Housing Equipment & Environment	41	.4	210	.6	696	1.6
Foods and Nutrition	70	.7	371	1.0	978	2.3
Home Management and Family Economics	24	.2	203	.5	236	.5
Restaurant and Hotel Management	11	.1	132	.3	285	.7
Child Development and Family Life	36	.4	973	2.6	0	0
Total	225	2.2	2,162	5.7	5,627	13.1
HSSE-Administration	22	.2	0	0	1,060	2.5
Creative Arts	237	2.3	513	1.4	1,694	3.9
Audiology & Speech Sciences	120	1.2	374	1.0	642	1.5
Education	345	3.4	3,083	8.2	1,935	4.5
English	821	8.0	2,726	7.2	1,094	2.5
General Studies	17	.1	4	*	0	0
History	372	3.6	906	2.4	1,398	3.2
Foreign Language and Literature	657	6.4	1,607	4.3	782	1.8
Philosophy	176	1.7	286	.8	228	.5
Physical Education-Men	2	*	114	.3	854	2.0
Physical Education-Women	15	.1	47	.1	766	1.8
Political Science	180	1.7	1,433	3.8	1,157	2.7
Psychological Science	245	2.4	2,228	5.9	1,568	3.6
Sociology and Anthropology	247	2.4	948	2.5	1,014	2.4
Communication	59	.6	1,020	2.7	1,504	3.5
American Studies	17	.2	0	0	0	0
Total	3,532	34.3	15,289	40.6	15,696	36.4

(1)Includes photocopies

*Less than .1%

Table 5.2

Research Development Unit

Circulation Study

Distribution of Loans to Faculty and Students

By School and Department (1)

School/Department	Faculty		Graduate Students		Undergraduates	
	Number of loans	% of total	Number of loans	% of total	Number of loans	% of total
Industrial Management	371	3.6	2,114	5.6	3,108	7.2
Pharmacy-Administration	70	.7	57	.2	578	1.3
Bionucleonics	48	.5	336	.9	0	0
Medicinal Chemistry and Pharmacognosy	113	1.1	310	.8	0	0
Pharmacology and Toxicology	80	.8	203	.5	0	0
Clinical Pharmacy	38	.3	68	.2	0	0
Industrial and Physical Pharmacy	54	.5	254	.7	0	0
Total	403	3.9	1,228	3.3	578	1.3
Science-Administration	0	0	0	0	740	1.7
Biological Sciences	290	2.8	1,155	3.0	2,065	4.8
Chemistry	1,012	9.8	3,530	9.4	657	1.5
Mathematical Sciences	731	7.1	893	2.4	1,119	2.6
Physics	215	2.1	901	2.4	451	1.0
Geosciences	240	2.4	444	1.2	332	.8
Computer Sciences	114	1.1	315	.8	582	1.4
Statistics	72	.7	409	1.1	16	*
Total	2,674	26.0	7,647	20.3	5,962	13.8
Veterinary Medicine-Administration	18	.2	411	1.1	0	0
Veterinary Anatomy	56	.6	33	.1	0	0
Veterinary, Microbiology, Pathology & Public Health	116	1.1	137	.4	0	0
Veterinary Physiology and Pharmacology	24	.2	5	*	0	0
Animal Clinics	43	.4	10	*	0	0
Total	257	2.5	596	1.6	0	0
Aviation Technology	32	.3	0	0	443	1.0
Construction Technology	0	0	0	0	105	.3
Electrical Technology	4	*	0	0	226	.5
Industrial Education	39	.4	420	1.1	195	.5
Manufacturing Technology	21	.2	0	0	306	.7
Nursing	12	.1	0	0	774	1.8
Supervision Technology	7	.1	0	0	147	.3
Total	115	1.1	420	1.1	2,196	5.1
Totals	10,295	100.0	37,647	100.0	43,159	100.0

(1) Includes photocopies

*Less than .1%

Table 5A.1

Research Development Unit

Circulation Study

Distribution of Purdue

Population Groups and Library Loans[1]

School/Department	Faculty[2] % Population	Faculty % loans	Graduate Students % Population	Graduate Students % loans	Undergraduates % Population	Undergraduates % loans
Agriculture-Administration	.7	.2	0	.1	7.8	4.9
Agricultural Economics	2.7	3.4	1.6	1.7	1.1	.4
Agricultural Engrg.	1.3	.2	.5	.2	.2	.1
Agronomy	3.0	.8	1.9	1.3	.6	.3
Animal Sciences	3.1	.8	1.3	.5	1.6	.7
Biochemistry	2.0	2.2	1.0	.7	.3	.3
Botany & Plant Pathology	1.9	1.2	.8	.7	.1	.1
Entomology	1.8	1.0	.7	.4	.2	.4
Forestry & Natural Resources	1.6	1.3	.9	.5	1.8	2.9
Horticulture	1.8	1.2	.5	.3	1.3	1.3
Total	19.9	12.3	9.5[3]	6.4	15.0	11.4
Engineering-Administration	.4	.9	0	*	.3	0
Aero and Astro Engrg.	1.6	1.7	1.5	1.4	1.1	1.0
Chemical Engrg.	1.1	1.3	1.4	1.9	1.2	.7
Civil Engrg.	3.5	2.5	4.1	3.2	2.2	1.7
Electrical Engrg.	3.1	3.5	4.7	3.6	2.9	1.6
Freshman Engrg.	.6	.1	0	0	6.6	2.8
Industrial Engrg.	1.2	.8	1.6	1.2	1.1	.7
Mechanical Engrg.	3.3	2.4	3.4	2.6	3.0	1.8
Materials Science Engrg.	.7	.6	.5	.4	.2	.3
Nuclear Engrg.	.6	.3	1.0	1.1	0	0
Interdisciplinary Engrg.	*	*	*	*	1.3	1.4
Total	16.1	14.1	18.2	15.4	19.9	11.7
Home Economics-Administration	.4	*	0	*	1.7	5.2
Clothing and Textiles	.6	.4	.4	.7	1.4	2.8
Housing, Equipment & Environment	.5	.4	.4	.6	1.5	1.6
Foods and Nutrition	.7	.7	1.0	1.0	1.3	2.3
Home Management & Family Economics	.4	.2	.6	.6	.3	.5
Restuarant & Hotel Management	.4	.1	.3	.3	.7	.7
Child Development and Family Life	.8	.4	1.6	2.6	1.0	0
Total	3.8	2.2	4.4	5.7	7.9	13.1
HSSE-Administration	.4	.2	0	0	.2	2.3
Creative Arts	2.2	2.3	1.6	1.4	1.9	3.9
Audiology & Speech Sciences	1.5	1.2	1.7	1.0	1.5	1.5
Education	3.3	3.4	17.1	8.2	3.9	4.5
English	3.7	8.0	3.5	7.2	.9	2.5
General Studies	0	.1	0	*	1.9	0
History	1.6	3.6	.7	2.4	.5	3.2
Foreign Language and Literature	2.4	6.4	1.3	4.3	.8	1.8
Philosophy	1.1	1.7	.6	.8	.1	.5
Physical Education-Men	.7	*	1.2	.3	1.7	2.0
Physical Education-Women	.9	.1	.1	.1	.6	1.8
Political Science	1.3	1.7	1.2	3.8	1.2	2.7
Psychological Science	2.7	2.4	4.4	5.9	1.7	3.6
Sociology and Anthropology	1.9	2.4	1.4	2.5	1.0	2.4
Communication	1.3	.6	1.9	2.7	1.8	3.5
American Studies	0	.2	0	0	0	0
Total	25.0	34.3	36.7	40.6	19.7	36.4

(1) Includes photocopied items and population based on data supplied by the Registrar's Office and the Personnel Office.

(2) Teaching faculty only.

(3) 14 students (.3%) in Agricultural Extension Education included in total.

*Less than .1%

Table 5A.2

Research Development Unit

Circulation Study

Distribution of Purdue

Population Groups and Library Loans[1]

School/Department	Faculty[2]		Graduate Students		Undergraduates	
	% Population	% loans	% Population	% loans	% Population	% loans
Industrial Management	3.7	3.6	7.6	5.6	11.1	7.2
Pharmacy-Administration	.2	.7	0	.2	3.3	1.3
Biomucleonics	.6	.5	1.0	.9	0	0
Medicinal Chemistry and Pharmacognosy	1.0	1.1	.5	.8	0	0
Pharmacology and Toxicology	.6	.8	.4	.5	0	0
Clinical Pharmacy	.8	.3	.3	.2	0	0
Industrial and Physical Pharmacy	.5	.5	.6	.7	0	0
Total	3.7	3.9	2.8	3.3	3.3	1.3
Science-Administration	.2	0	0	0	2.2	1.7
Biological Sciences	3.4	2.8	3.2	3.0	5.3	4.8
Chemistry	4.2	9.8	5.6	9.4	1.1	1.5
Mathematical Sciences	3.7	7.1	2.4	2.4	2.1	2.6
Physics	3.8	2.1	2.7	2.4	.6	1.0
Geosciences	1.3	2.4	1.4	1.2	.8	.8
Computer Sciences	1.1	1.1	2.3	.8	1.4	1.4
Statistics	.9	.7	1.1	1.1	*	*
Total	18.6	26.0	18.7	20.3	13.5	13.8
Veterinary Medicine-Administration	.4	.2	.3	1.1	1.3	0
Veterinary Anatomy	.5	.6	.2	.1	0	0
Veterinary, Microbiology, Pathology & Public Health	.8	1.1	.5	.4	0	0
Veterinary Physiology and Pharmacology	.3	.2	.1	*	0	0
Animal Clinics	1.4	.4	.1	*	0	0
Total	3.4	2.5	1.2	1.6	1.3	0
Technology-Administration	1.3	.3	0	0	1.1	1.0
Aviation Technology	.2	0	0	0	1.0	.3
Construction Technology	.8	*	0	0	1.4	.5
Electrical Technology	.7	.4	.9	1.1	.5	.5
Industrial Education	.9	.2	0	0	1.3	.7
Manufacturing Technology	1.5	.1	0	0	2.1	1.8
Nursing	.3	.1	0	0	.9	.3
Supervision Technology	.2	0	0	0	0	0
Total	5.8	1.1	.9	1.1	8.3	5.1
Totals	100.0	100.0	100.0	100.0	100.0	100.0

(1) Includes photocopied items and population based on data supplied by the Registrar's Office and the Personnel Office.

(2) Teaching faculty only.

*Less than .1%

Table 6.1

Research Development Unit

Circulation Study

Loans Per Capita by Level,

Department, and School[1]

School/Department	Faculty[2]		Graduate Students		Undergraduates	
	Population	Per Capita loans	Population	Per Capita loans	Population	Per Capita loans
Agriculture-Administration	14	1.4	0	0	1,571	1.3
Agricultural Economics	54	6.5	77	8.2	222	.9
Agricultural Engrg.	25	.7	26	2.1	45	1.3
Agronomy	60	1.3	92	5.3	115	1.1
Animal Sciences	61	1.4	64	2.7	315	1.0
Biochemistry	39	5.9	51	5.1	63	1.9
Botany & Plant Pathology	37	3.2	38	6.7	21	2.2
Entomology	36	2.9	31	5.0	40	4.3
Forestry & Natural Resources	32	4.1	46	4.1	370	3.3
Horticulture	36	3.5	24	5.5	269	2.1
Total	394	3.2	463(3)	5.2(4)	3,031	1.6
Engineering-Administration	8	11.6	0	0	55	0
Aero and Astro Engrg.	32	5.5	76	6.9	212	2.0
Chemical Engrg.	22	6.1	68	10.3	252	1.1
Civil Engrg.	69	3.7	201	6.0	454	1.7
Electrical Engrg.	62	5.8	228	6.0	596	1.2
Freshman Engrg.	12	.9	0	0	1,337	.9
Industrial Engrg.	23	3.3	79	5.9	220	1.4
Mechanical Engrg	65	3.8	169	5.8	607	1.3
Materials Science Engrg.	14	4.6	23	6.4	44	2.5
Nuclear Engrg.	11	2.8	47	8.9	0	0
Interdisciplinary Engrg.	1	5.0	1	2.0	265	1.9
Total	319	4.6	892	6.5(5)	4,012	1.3
Home Economics-Administration	8	.8	0	0	348	6.4
Clothing and Textiles	13	2.8	21	13.0	293	4.1
Housing, Equipment, and Environment	10	4.1	18	11.7	294	2.4
Foods and Nutrition	14	5.0	51	7.3	270	3.7
Home Management and Family Economics	8	3.0	29	7.0	59	4.0
Restaurant and Hotel Management	7	1.6	17	7.8	139	2.1
Child Development and Family Life	16	2.3	80	12.2	195	0
Total	76	3.0	216	10.0(5)	1,598	3.5

(1) Per Capita figures are based on head count data supplied by the Registrar's Office and the Personnel Office.

(2) Teaching faculty only.

(3) 14 additional students in Extension Education added to total only.

(4) 53 loans made to graduate students in Agriculture-Administration included in per capita total only.

(5) 1 loan made to graduate students in Engineering-Administration and Home Economics-Administration included in per capita total only.

Table 6.2

Research Development Unit

Circulation Study

Loans Per Capita by Level,
Department, and School(1)

School/Department	Faculty(2)		Graduate Students		Undergraduates	
	Population	Per Capita loans	Population	Per Capita loans	Population	Per Capita loans
HSSE-Administration	8	2.8	0	0	40	26.5
Creative Arts	44	5.4	76	6.8	394	4.3
Audiology & Speech Sciences	29	4.1	84	4.5	304	2.1
Education	65	5.3	838	3.7	797	2.4
English	73	11.2	172	15.8	189	5.8
General Studies	0	0	0	0	377	0
History	32	11.6	33	27.5	105	13.3
Foreign Language and Literature	48	13.7	62	25.9	162	4.8
Philosophy	21	8.4	27	10.6	29	7.9
Physical Education-Men	15	.1	61	1.9	350	2.4
Physical Education-Women	17	.9	5	9.4	111	6.9
Political Science	25	7.2	60	23.9	241	4.8
Psychological Science	54	4.5	214	10.4	348	4.5
Sociology and Anthropology	37	6.7	71	13.4	210	4.8
Communication	26	2.3	92	11.1	350	4.3
American Studies	0	0	0	0	0	0
Total	494	7.1(6)	1,795	8.5(7)	4,007	3.9
Industrial Administration	73	5.1	371	5.7	2,245	1.4
Pharmacy-Administration	3	23.3	0	0	659	.9
Bionucleonics	13	3.7	51	6.6	0	0
Medicinal Chemistry and Pharmacognosy	19	5.9	23	13.5	0	0
Pharmacy and Toxicology	13	6.2	21	9.7	0	0
Clinical Pharmacy	16	2.4	13	5.2	0	0
Industrial and Physical Pharmacy	9	6.0	29	8.8	0	0
Total	73	5.5	137	9.0(8)	659	.9
Science-Administration	4	0	0	0	440	1.7
Biological Sciences	67	4.3	156	0	1,070	1.9
Chemistry	82	12.3	273	4.2	216	3.0
Mathematical Sciences	73	10.0	119	29.7	423	2.6
Physics	76	2.8	134	6.7	114	4.0
Geosciences	25	9.6	68	13.3	155	2.1
Computer Sciences	22	5.2	111	4.0	295	2.0
Statistics	18	4.0	52	6.0	15	1.1
Total	367	7.3	913	8.4	2,728	2.2
Veterinary Medicine-Administration	8	2.3	15	27.4	274	0
Veterinary Anatomy	10	5.6	10	3.3	0	0
Veterinary, Microbiology, Pathology & Public Health	15	7.7	26	5.3	0	0
Veterinary Physiology and Pharmacology	7	3.4	6	.8	0	0
Animal Clinics	27	1.6	3	3.3	0	0
Total	67	3.8	60	9.9	274	0
Aviation Technology	26	1.2	0	0	223	2.0
Construction Technology	3	0	0	0	198	.5
Electrical Technology	16	.3	0	0	284	.8
Industrial Education	33	3.0	44	9.5	95	2.1
Manufacturing Technology	17	1.2	0	0	265	1.2
Nursing	30	.4	0	0	426	1.8
Supervision Technology	6	1.2	0	0	195	.8
Technology Administration	4	0	0	0	0	0
Total	115	1.0	44	9.5	1,686	1.3
Totals	1,978	5.2	4,891	7.7	20,270	2.1

(1) Per Capita figures are based on head count data supplied by the Registrar's Office and the Personnel Office.

(2) Teaching faculty only.

(6) No faculty in General Studies or American Studies, 34 loans and 17 loans respectively, included in the per capita total only.

(7) 4 loans to graduate students in General Studies included in per capita total only.

(8) 57 loans to graduate students in Pharmacy-Administration included in per capita total only.