ABSTRACT
        A procedure for reallocating faculty positions is
described that uses credit hour guidelines that are quantitatively
established using instructional method as the unit of analysis
(rather than academic unit). Formally recognized guidelines for
varying instructional methodologies are also applied to actual
instructional experiences of academic units to determine credit hour
expectations for these units. The proposed procedure is based on the
assumption that instructional method and number of students are two
of the most crucial elements in the internal allocation process. It
is also assumed that any targets for credit hour per full-time
equivalent (FTE) teachers represents a compromise between the total
resources available to the institution and the instructional
methodologies preferred by the disciplines. Four types of instruction
and examples of each type are identified: individual instruction;
small laboratory, seminar, field work; skill and upper division
classes; and regular classes. The appropriate instructional mode for
each course was classified, and the number of FTE budgeted faculty
and the number of instructional hours taught by graduate teaching
assistants and part-time faculty was gathered for each department.
For each department and for each mode of instruction, information was
gathered on the number of class sections taught, faculty credit hours
or total course credit hours taught, number of student enrollments in
all class sections, and total student credit hours generated by all
class sections. A formula for computing expected student credit hours
and entitled FTE faculty for each department is presented. Uses and
abuses of the procedure are noted. (SW)

REALLOCATION OF FACULTY RESOURCES

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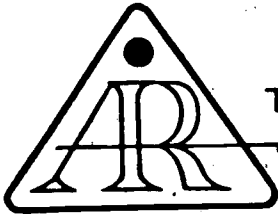
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3.

REALLOCATION OF FACULTY RESOURCES

Reallocation of faculty positions among academic units is often
accomplished by following an informally established set of guidelines
indicating the acceptable level of credit hour production in each
unit. This study provides a procedure whereby these credit hour
guidelines are quantitatively established using instructional method
as the unit of analysis rather than academic unit. Formally recognized
guidelines for varying instructional methodologies are subsequently.
applied to actual instructional experiences of academic units to
determine credit hour expectations for these units.

Many formulae are used in higher education today to aid administrators in allocating faculty positions to academic units. The majority of these are ratios that relate faculty, in terms of headcount or full-time equivalent students, to faculty productivity. The most widely-used measures of faculty productivity are based on the student credit hour or a derivative of it. The scenario goes like this: predetermined averages, often called targets or objectives, are established for each academic unit. In this example, target workloads are established in terms of student credit hours per equivalent full-time faculty member (EFT). When average credit hour production per faculty member exceeds the established target, resources are added to the department to increase the complement of faculty and thus bring the ratio closer to the target. As credit hour production falls, positions are withdrawn from the department, although in practice the fit between expectations and reductions is not nearly as close.

This technique is not without weaknesses. Nonetheless, the theory and mathematics of the practice are easily understood and the process appears equitable; more important, it is a well-established common practice in higher education today. In times of comparative national prosperity and satisfaction

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with higher education, this and similar processes simply result in "incremental" resource allocation, a method which has, understandably, gone largely unchallenged until recently. In the current period, new resources are far more difficult to attract and attention focuses on reallocation of existing resources. Although the primary question--how do we equitably and effectively deploy our resources--is the same under both economic conditions, the discussion becomes far more politically charged and the ramifications of inflexible policies become painfully evident when resources are scarce.

However, initiating radical new allocation policies will not relieve the economic pressures of the day nor is it likely to re-establish higher education as sacrosanct in the view of federal, state, and local politicians or the United States' citizenry. In fact, wholesale change in institutional policy is often detrimental. Not only do funding agency personnel suspect that changes are made solely on the basis of implied financial gain, but un-certainty on the local campus is heightened as faculty grapple with the implications of national trends and their impact on a new and less understood local allocation process. For these and other reasons it seems only reason-able to examine the existing practice and retain the best features while correcting its weaknesses. At this urban-centered state university, the decision was made to continue considering credit hour workload information during the allocation process. However, the procedure for establishing credit hour per EFT expectations was to be formalized and equitable levels for each credit-producing unit quantitatively established. The procedure was to be kept relatively simple, not mathematically complex. The resulting iterative procedure was to help pinpoint extremes and was not designed to provide a simple answer to a complex question.

Historical Perspective

Most allocation processes based on productivity targets or objectives are

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historically based and seldom documented. As institutions grow and mature, certain patterns of academic unit development emerge. Most of these targets are in part determined by the priority of the academic unit in the development of the institution, the ability of past academic unit leadership to present strong and convincing arguments, and perceptions held by central administrators of how instruction·should be performed in the various academic units. In general these influences have combined to result in slightly higher targets in the social sciences and humanities than in the natural sciences and professional areas. This is in fact how the workload expectations developed at this institution. Despite their informality, these expectations weigh heavily on allocation decisions.

An initial step in formalizing the procedure was to examine several of the assumptions underlying the existing practice.

(1) Historical decisions have led to fair and equitable resource distribution and reflect the priorities and needs of the institution. Although fair and equitable may seem foreign to some allocation procedures, today's departmental staffing levels generally reflect the combined effects of past institutional priorities and needs.

(2) Overall allocation procedures remain fairly constant. This is particularly evident in public institutions where faculty positions or the dollars to fund them are based on uniform allocation procedures such as student credit hours, full-time equivalent students, numbers of graduate and undergraduate students, or similar measures that have been in effect for many years.

(3) The relative mix of students among the various disciplines is stable. This assumption is perhaps the most volatile. As society develops and grows, the demand for individuals with particular skills changes. Lagging shortly behind these societal changes are student enrollment changes. The current

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popularity of the engineering, business, and computer science fields provide prime examples.

(4) Academic unit instructional strategy is the same for all disciplines. Teaching strategies and student needs vary. Some disciplines require consider-able individual, small group, or laboratory contact. Others operate quite nicely with medium-to-large lecture courses. The existing procedure generally assumes that instructional strategy is stable within and across academic units.

(5) Perhaps most important is the assumption that central administrators are able to comprehend the interplay among these basic assumptions and modify targets or expectations on the basis of changing conditions.

Examine the simple example in Figure 1 where the institution receives funding for one full-time faculty position for each 250 credit hours produced during the fall term. The sample institutions' student credit hour production of 100,000 makes it eligible for 400 faculty positions. These faculty can ostensibly be deployed to the institution's three academic colleges in many ways. Actually the options are rather limited since student credit hours in College I totalled 50,000 while credit hours in Colleges II and III equaled 35,000 and 15,000 respectively. Figure 1 is a graphical representation of some possible assignments of credit hours per faculty member in the three academic colleges.

It is immediately apparent that large portions of the graph represent credit hour assignments that are incompatible under the existing funding pro-cedure. It is literally impossible to assign credit hour expectations to faculty in the three colleges from points on the graph lying to the left and below the curve labeled infinity while still maintaining the overall ratio of one faculty for each 250 student credit hours generated. It is apparent that modest changes in one college can produce dramatic changes in the others and

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that subtle changes in teaching method or minor changes in the relative pro-
portions of majors can have major implications for faculty workloads and
faculty allocation procedures. For example, the circle in Figure 1 represents
a particular set of credit hour per EFT expectations for faculty in the three
sample colleges. College I faculty are expected to produce approximately 270
credit hours each, while College II and College III faculty are expected to
generate 300 credit hours and 150 credit hours, respectively. Further assume
that institutional policy changes will reduce the credit hour expectation in
College I by approximately 7 percent, to 250, while retaining expectations in
College III at 150. In order to remain within the institutional funding limit
of one faculty for each 250 credit hours, faculty in College II will have to
carry loads of approximately 350 credit hours. This 50 credit hour increase
over earlier expectations represents an increase of nearly 17 percent. This
policy change results in a shift of 15 faculty positions from College II to
College I.

Instructional Method and Reallocation
      Fundamental to the process described herein are the assumptions that
instructional method and numbers of students are two of the most crucial ele-
ments in the internal allocation process; that resources should be related to
effort; that expectations should be based on the appropriate type of instruc-
tion and not on a blanket assumption that any academic unit will teach all its
courses under a single type of instruction; that any set of credit hour per
EFT targets represents a compromise between the total resources available to
the institution and the instructional methodologies preferred by the disci-
plines; and that priorities of the institution may allow selected units to
adopt instructional methods closer to the ideal.

      The process depends largely on the identification and description of a
limited but reasonably comprehensive number of instructional modes into which

all courses can be categorized. Our original nine categories of teaching method have been reduced to four with the determining factor being reasonableness of class size. The four modes range from individual instruction format to large lecture format (see Table 1 for descriptions and examples).

The most time-consuming task is determining the appropriate instructional mode for each course. Fortunately, our existing course classification system allowed for computerized preliminary assignments. These preliminary assignments were reviewed and corrected by a special review committee and the appropriate departmental chairperson. At the outset of the project, it was feared that this task might jeopardize the entire project. Surprisingly, the assignments were much easier than anticipated, although the process was time-consuming because of the sheer volume of courses.

Faculty information was also collected. This information, including the number of equivalent full-time budgeted faculty and the number of instructional hours taught by graduate teaching assistants and part-time faculty, was gathered for each department. It was necessary to assign each graduate teaching assistant and part-time faculty member an EFT since this is not routinely done by the institution. For this project, one EFT was assigned for each 15 hours of instruction taught by graduate teaching assistants or 18 hours of instruction taught by part-time faculty members. One-half of one EFT was deducted from each department total for departmental administration.

Upon completion of the course classification and faculty count, departmental summaries were prepared. These summaries included for each mode of instruction:

1. Number of class sections taught.

2. Faculty credit hours or total course credit hours taught
   (for example, six 3-hour courses equal 18 faculty credit hours).

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3. Number of student enrollments in all class sections.

4. Total student credit hours generated by all class sections.

Some final modifications were made to account for crosslisted courses and team-taught courses. Crosslisted courses were awarded to the department providing the instruction while team-taught courses were proportionally divided between the departments providing the instruction.

If no uniform faculty credit hour formula exists for TYPE I instruction, it is necessary to establish a value that best reflects the effort and practice used in assigning teaching loads. The number of class sections and faculty credit hours are used to compute average class size and to provide estimates of the EFT devoted to each type of instruction. These data make it possible to compute average student credit hour loads per equivalent full-time faculty member for each mode of instruction.

If the hypothesis is acceptable that the existing average student credit hour per EFT load in each instructional type is equitable and appropriate, it is possible to compute an expected student credit hours (ESCH) and an entitled equivalent full-time faculty (EEFT) for each department. The formulae follow:

$$ESCH(j) = \sum_{i=1}^{4} A(i)*E(i,j)$$

$$EEFT(j) = \sum_{i=1}^{n} A(i)/S(i,j).$$

Where:

$SCH(i)$ = total student credit hours in type i instruction

$EFT(i)$ = total equivalent full-time faculty devoted to type i
           instruction

$A(i) = SCH(i)/EFT(i)$ = average student credit hour per EFT load
           in type i instruction

$S(i,j)$ = student credit hours in type i instruction in department j

$E(i,j)$ = equivalent full-time faculty in type i instruction in department j.

Indeed, if A is established mathematically or theoretically for each instructional type, the number of expected student credit hours and the number of equivalent full-time faculty to which the academic unit is entitled can be determined. However, practical considerations require that the total expected student credit hours and the faculty entitlement do not exceed those that exist during a given semester within the institution. For example, if $A(1)$ is reduced from its actual value, some or all of $A(2)$, $A(3)$, and $A(4)$ must be increased to keep the distribution of resources within the existing budget allocation.

In the preliminary report, existing average credit hour per EFT figures in each course type were accepted as reasonable goals. The existing average credit hour per EFT figures are shown below.

TYPE I	TYPE II	TYPE III	TYPE IV
34	136	278	496

This set of recommendations then led to a set of credit hour expectations and recommended staffing levels for departments and colleges. These expectations are summarized in Tables 2 through 5.

Uses and Abuses

The value of the procedure is not the results of the calculation, but how the results are viewed and used in decision-making. The procedure is still young and has not yet passed all institutional hurdles. Fortunately the institution is still growing and the full impact of potential declines has not yet been felt. However, reallocation decisions are made even in a growth

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period. The process has been used to identify departments where existing production and expected production are vastly different. Changes have not been made solely on the basis of these differences, but changes have been considered because of them.

In addition, the formalized credit hour expectations have been used to examine the implications of teaching technique. Some departments can free faculty time to provide the desired individual instruction by offering other classes in medium-sized lecture formats. Although this is not always practical, formalized expectations allow a department to better control its own destiny. There is a reward for good planning and proper course development.

New program staffing demands have been projected and the implications for other departments examined. It becomes acutely obvious using this procedure that gains in one area are by necessity losses in another.

The procedure is not without problems. Most, however, are not unique to this particular process, but indicative of all processes where targets or objectives are developed. In this case, course types can be changed to improve one's position. If this is done wholesale across the institution, a problem does not arise since the whole average would change accordingly. However, the potential for abuse does exist if selected departments are able to manipulate instructional methodologies.

The preliminary report accoepted existing credit hour expectations for the four modes of instruction as equitable and appropriate. It is possible that these figures are not the most equitable and that another distribution of faculty resources would result in more student credit hours being generated by the institution and ultimately a larger number of faculty would be available to the institution.

The process is iterative and the results change from iteration to iteration.

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Although some individuals have extreme difficulty dealing with this, the problem is actually minimal since dramatic changes are not likely to occur over a short period of time.

And, finally, some expectations cannot be met. Tenure precludes removing positions from some areas and the inability to recruit faculty precludes adding positions in others.

Figure 1. Possible Assignments of Credit Hour per EFT for
Faculty in Three Sample Academic Colleges

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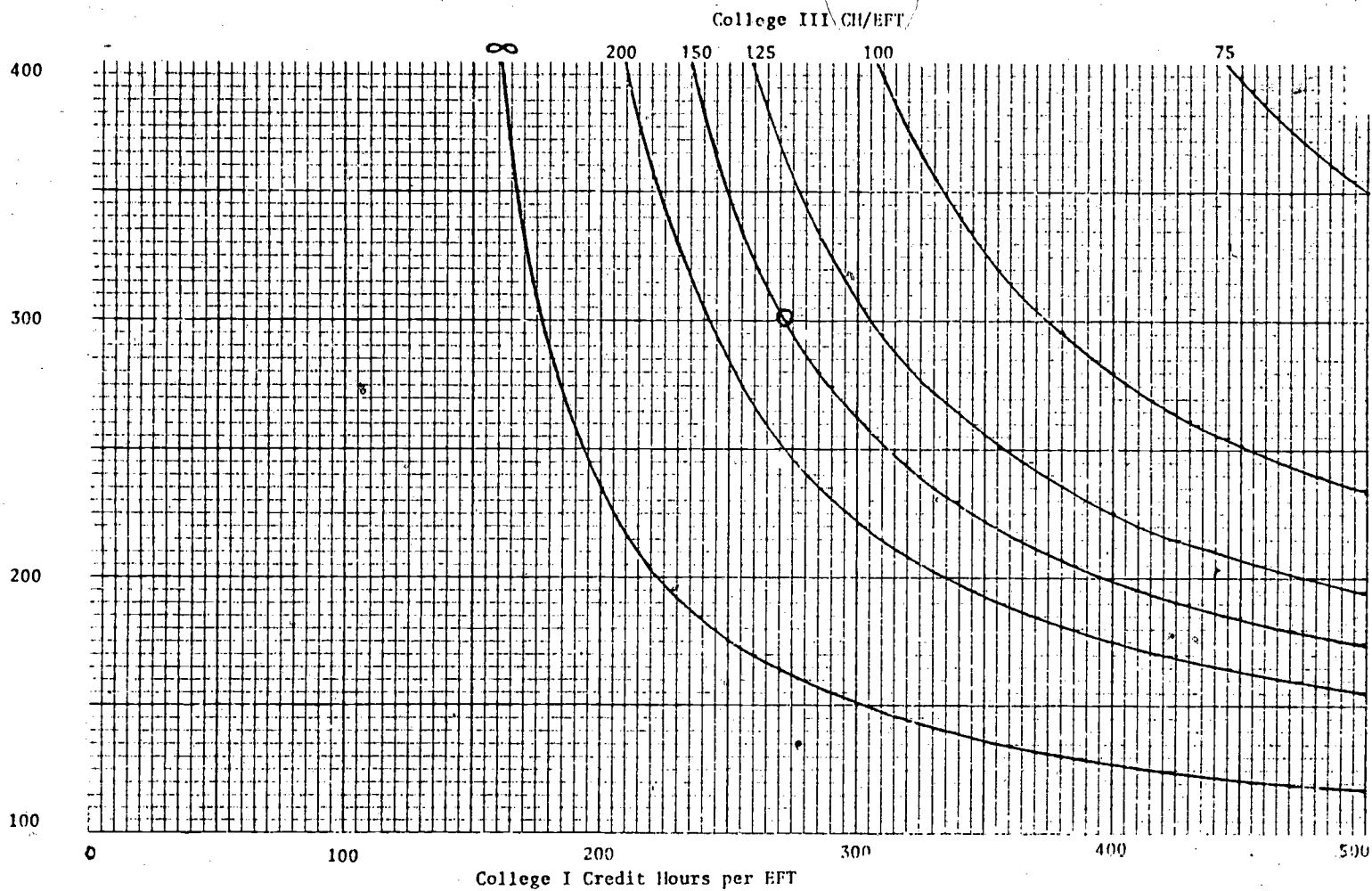
TABLE 1.

Modes of Instruction

Type I	-	INDIVIDUAL INSTRUCTION
Key Characteristics	-	Active and continuous individual instruction, usually not in a classroom.
Examples	-	Doctoral dissertation
	-	Masters thesis
	-	Private music lessons
	-	Directed readings
	-	Directed research
Type II	-	SMALL LABORATORY, SEMINAR, FIELD WORK
Key Characteristics	-	Small group instruction with intermittent individual attention given to all students.
	-	Usually not taught in a classroom.
	-	Limited laboratory space.
Examples	-	Small laboratory classes
	-	Field work, internships, practicums
	-	Graduate seminars and courses numbered 800 and above
	-	Small group music lessons
Type III	-	SKILL AND UPPER DIVISION CLASSES
Key Characteristics	-	Some individual attention to most students.
	-	Nearly daily assignments which must be evaluated and returned.
	-	A firm prerequisite which in turn has a firm prerequisite (other than departmental consent).
	-	Courses numbered 500 and above.
Examples	-	English composition and creative writing
	-	Mathematics, computer science, accounting, and some engineering courses
	-	Medium-sized group fine arts classes
	-	Foreign language classes
	-	Graduate level workshops
Type IV	-	REGULAR CLASSES
Key Characteristics	-	Courses graded primarily on the basis of a few papers and/or tests.
	-	No extensive individual attention needed.
	-	Courses with little work done outside of class.
Examples	-	General education courses
	-	Introduction to XXXXXX
	-	Survey of XXXXXX
	-	XXXXX appreciation
	-	XXXXX 101
	-	Undergraduate workshops
	-	Large group performance courses

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TABLE 2. Student Credit Hours Per Full-Time Equivalent
Faculty Member by Type of Instruction
and Department

Department	Instructional Type				Departmental Average
	I	II	III	IV	
BIOLOGY	28	164	163	584	262
CHEMISTRY	33	209	207	622	264
COMP SCI	35	232	178	1070	288
GEOLOGY	39	214	221	653	307
MATHEMATICS	36	83	378	465	370
PHYSICS	42	144	388	816	318
ADMIN JUST	47	113	257	393	203
ANTHROPOLOGY	29	35	106	341	203
MINCRITY STUDIES	44	15	66	335	219
POLITICAL SCI	28	136	136	435	272
PSYCHOLOGY	29	66	196	914	376
SOCIOLOGY	35	77	234	702	297
WOMEN'S ST	0	0	0	237	237
AMERICAN ST	67	78	0	1066	534
ENGLISH	31	77	233	305	219
GERMAN	42	76	244	0	209
HISTORY	31	38	117	423	252
JOURNALISM	40	110	196	527	197
RELIGION	31	0	0	233	212
PHILOSOPHY	27	0	176	476	375
ROMANCE LANGUAGE	41	73	240	G	224
SPEECH	36	133	324	481	276
INDUST EDUC	39	153	277	394	187
LOGOPEDICS	25	112	137	376	117
INSTR SERV	33	164	341	351	245
GERONTCLOGY	42	94	0	513	257
PHYS EDUC	48	56	252	321	228
PERS SERV	33	149	227	0	146
ART	41	182	149	525	198
MUSIC	34	157	188	715	88
DANCE	0	60	0	0	60
DENT HYG	0	55	167	269	118
HEALTH EDUC	32	0	274	380	248
HEALTH SCI	0	184	0	330	288
MED TECH	23	96	95	0	75
NURSE CLIN	0	76	84	0	79
NURSING	21	70	121	311	97
PHYS THER	0	83	144	189	123
PHYS ASST	0	81	278	275	107
RESP THER	54	97	358	0	122
ACCOUNTING	34	343	502	0	484
BUS ADMIN	32	214	338	833	433
BUS EDUC	43	193	0	0	165
ECONOMICS	29	178	298	520	369
AERO ENGR	31	99	256	417	227
ELECT ENGR	35	315	331	378	264
INDUST ENGR	41	270	391	0	338
MECH ENGR	39	245	360	835	281
ENGR TECH	40	134	224	0	195
UNIV AVG	34	136	278	496	239

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TABLE 3. Departmental Credit Hour Production and Expectations
and Departmental EFT Faculty Positions and
EFT Faculty Entitlements

Department	Departmental Credit Hours			Departmental EFT Faculty Positions			
	Actual	Expected	Percent of Expected	Actual	Entitled	Percent of Entitled	Change
BIOLOGY	4671	4427	106	17.9	18.3	98	- 0.4
CHEMISTRY	4098	3468	118	15.5	18.9	82	- 3.4
COMP SCI	2183	1921	114	7.6	8.5	89	- 0.9
GEOLOGY	2825	2192	129	9.2	12.3	75	- 3.1
MATHEMATICS	13195	9771	135	35.6	47.9	74	-12.3
PHYSICS	2569	1885	136	8.1	10.4	78	- 2.3
ADMIN JUST	5264	6135	86	25.9	24.5	106	1.5
ANTHROPOLOGY	1593	2692	59	7.8	4.4	179	3.5
MINORITY ST	1425	2144	66	6.5	5.3	122	1.2
POLITICAL SCI	3063	3875	79	11.3	8.7	129	2.6
PSYCHOLOGY	5976	4295	139	15.9	17.5	91	- 1.6
SOCIOLOGY	4456	3955	113	15.0	15.1	99	- 0.1
WOMEN'S ST	396	828	48	1.7	0.8	209	0.9
AMERICAN ST	1175	576	204	2.2	4.2	53	- 2.0
ENGLISH	9913	12634	78	45.2	35.9	126	9.3
GERMAN	894	1047	85	4.3	3.6	118	0.6
HISTORY	3277	4780	69	13.0	8.0	163	5.0
JOURNALISM	1181	1384	85	6.0	5.1	118	0.9
RELIGION	1164	2460	47	5.5	2.8	194	2.7
PHILOSOPHY	2064	2309	89	5.5	4.7	117	0.8
ROMANCE LANG	3733	4382	85	16.7	14.1	118	2.6
SPEECH	5107	4594	111	18.5	20.4	91	- 1.9
INDUSTRIAL EDUC	998	963	104	5.3	5.7	93	- 0.4
LOGOPEDICS	1542	2338	66	13.2	9.3	142	3.9
INSTR SERV	9178	8468	108	37.4	42.2	89	- 4.8
GERONTOLOGY	360	376	96	1.4	1.3	111	0.1
PHYS EDUC	3141	4772	66	13.8	8.7	158	5.1
PERS SERV	1490	1387	107	10.2	11.0	93	- 0.8
ART	3896	3355	116	19.7	24.5	80	- 4.8
MUSIC	5252	5477	96	59.9	59.2	101	0.7
DANCE	219	498	44	3.7	1.6	227	2.1
DENT HYG	787	1546	51	6.7	3.2	212	3.5
HEALTH EDUC	897	1096	82	3.6	3.2	114	0.5
HEALTH SCI	621	844	74	2.2	1.9	115	0.3
MED TECH	298	608	49	4.0	2.3	172	1.7
NURSE CLIN	278	695	40	3.5	1.6	225	1.9
NURSING	3034	5751	53	31.3	16.4	190	14.8
PHYS THER	320	677	47	2.6	1.4	187	1.2
PHYS ASST	805	1235	65	7.5	4.8	158	2.8
RESP THER	428	448	95	3.5	3.6	96	- 0.1
ACCOUNTING	6516	3539	184	13.5	25.2	53	-11.7
BUS ADMIN	12883	8756	147	29.7	41.5	72	-11.8
BUS EDUC	669	474	141	4.1	5.6	72	- 1.6
ECONOMICS	5518	5161	107	15.0	16.3	92	- 1.3
AERO ENGR	1742	1926	90	7.7	6.9	111	0.8
ELECT ENGR	1839	1527	120	7.0	8.7	80	- 1.7
INDUST ENGR	1332	887	150	3.9	6.1	64	- 2.2
MECH ENGR	1729	1283	135	6.1	8.2	75	- 2.1
ENGR TECH	769	924	83	3.9	3.4	116	0.5

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TABLE 4. Student Credit Hours Per Full-Time Equivalent
Faculty Member by Type of Instruction
and College

| College | Instructional Type | | | | College Average |
	I	II	III	IV	
EDUCATION	35	139	303	290	205
FINE ARTS	35	154	180	583	112
HEALTH	26	76	150	299	115
BUSINESS	33	203	394	741	411
ENGINEERING	36	206	309	476	259
LIBERAL ARTS	35	134	265	521	272
	34	133	280	500	238

TABLE 5.   College Credit Hour Production and Expectations
            and College EFT Faculty Positions and
            EFT Faculty Entitlements

| College | College Credit Hours | | | College EFT Faculty Positions | | | |
	Actual	Expected	Percent of Expected	Actual	Entitled	Percent of Entitled	Change
EDUCATION	16349	18725	87	79.9	77.2	103	2.7
FINE ARTS	9367	9513	98	83.3	85.4	98	- 2.1
HEALTH	7468	12955	58	64.9	38.5	168	26.4
BUSINESS	25586	17695	145	62.3	88.6	70	-26.3
ENGINEERING	7411	6520	114	28.6	33.3	86	- 4.7
LIBERAL ARTS	80222	80995	99	294.9	290.9	101	4.0
	146403			613.9			