

AN OBJECTIVE METHOD FOR EQUITABLE DISTRIBUTION OF WORKLOAD AMONG DENTAL FACULTY

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يتوجب على المسؤولين في كليات طب الأسنان اتخاذ قرارات لتحديد احتياجات كل قسم من أقسام الكلية لأعضاء هيئة التدريس بناء على العبء التدريسي الفعلي لكل قسم. تقدم هذه الدراسة طريقة لتقدير تلك الاحتياجات على مستوى الكلية والأقسام. ولقد تم في هذه الدراسة حساب عدد الساعات الفعلية للعبء التدريسي في أقسام كلية طب الأسنان - جامعة الملك سعود باستخدام هذه الطريقة المقترحة وأظهرت النتائج أنه بالرغم من أن بعض الأقسام لديها أعباء تدريسية مقبولة إلا أن هناك أقسام تعاني من زيادة أو قلة في الأعباء التدريسية عند مقارنتها بالعدد الحالي من أعضاء هيئة التدريس العاملون فيها.

Dental school administrators ought to make decisions concerning the assignment of faculty members to departments based upon actual teaching load for each department. This study offers a method to quantify an equitable teaching load among dental faculty, hence, among departments. Actual load in clock hours was computed for all four departments at King Saud University College of Dentistry. Results showed that while some departments are reasonably loaded, others have a teaching load that is heavier or lighter than the equitable work load figure.

While a College of Dentistry is commonly one of the smaller academic units in a University, administering its activities is very challenging.¹ The complexity of administering a College of Dentistry is, by necessity, the result of its mission. A College of Dentistry trains its students in the theoretical, applied, clinical, and professional sciences.²⁻⁶ The role of the College is further complicated by its being a specialty training site,^{7,8} a specialist hospital where patients are referred for highly specialized treatment as well as a general dental hospital for standard dental treatment.

Such complexity of the scope of a Dental College lies behind the commonly heard complaints of Dental College administrators^{2,9} as well as the "burn-out" phenomenon^{1,10,11} among dental faculty. This article is an attempt to address only one of

the challenges that meet the administrators of a Dental College, that is; the distribution of the work load equitably among departments of the College based on the number of their faculty members. To this end, the King Saud University College of Dentistry (KSUCD) will be used as an example. The suggestion proposed in the article can be applied to another College of Dentistry, of different administrative structure, with minor modification to accommodate structural difference.

Further, the concept in KSUCD is applicable to any University College provided that only aspects particular to the work scope of such a College are used.

Departmental Structure of KSUCD:

The College of Dentistry, King Saud University consists of two independent buildings separated by a distance of 23 kilometers. One building is exclusively for the education and training of the male students; the other building is for the female students. The College has one budget, one administration and the same faculty members.

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The College is divided into four departments; namely, Biomedical Dental Sciences (BDS), Preventive Dental Sciences (PDS), Restorative Dental Sciences (RDS) and Removable Prosthodontic Dental Sciences (SDS). Each department houses several dental specialties each of which is called a Division, as following:

Department of Biomedical Dental Sciences:

- Divisions of Oral Medicine/Diagnosis, Oral Pathology/Biology, Oral Surgery and Oral Radiology.

Department of Preventive Dental Sciences:

- Divisions of Periodontics, Orthodontics, Pedodontics and Preventive/Community Dentistry.

Department of Restorative Dental Sciences:

- Divisions of Operative Dentistry, Endodontics and Fixed Prosthodontics.

Department of Prosthetic Dental Sciences:

- Divisions of Complete Denture Prosthodontics, Partial Denture Prosthodontics, Maxillofacial/Implant Prosthodontics and Dental Materials.

Thus, KSUCD houses fifteen educational specialties of Dentistry that could be equated to another College of Dentistry with fifteen departments.

Teaching Staff of KSUCD:

At King Saud University, some of the leading graduates of each class are selected, after completion of one year internship, as demonstrators. The duties of a demonstrator in KSUCD are those of a subfaculty member and is equivalent to an instructor in other colleges of the world. The demonstrator does not lecture or direct a course but teaches in the laboratory and clinical sessions and is assigned half the number of the students assigned to a faculty member during these sessions.

The faculty members of KSUCD are assistant professors, associate professors and professors. King Saud University officially considers a specialist holder of the degree M.Sc. in the specialty a subfaculty position, and is given the title of lecturer. Such a specialist is generally qualified to be appointed as

an assistant professor in most U.S.A. schools of dentistry. For the purposes of this article, a KSUCD lecturer shall be computed as a faculty member.

Thus, the teaching staff of KSUCD are a combination of full time faculty members and demonstrators. No part time faculty members participate in teaching activities of KSUCD. For colleges where part time faculty participate in the teaching program, the full time equivalent (F.T.E.) method could be used for work load computation.

Another relatively unique feature of KSUCD is that it accepts students each semester. In this manner, the teaching load which is already done twice, once for males and once for females, is doubled again by each course being offered twice a year in each of the two buildings. The quadrupling of the teaching load is accurate when it is applied to didactic components. The load may be more or less than a four-fold for clinical/laboratory sessions due to variations in number of males from females and variations in the number of students accepted in the fall semester from those accepted in the winter semester. To illustrate the quadrupling phenomenon of teaching load in the didactic components, one may take one course of the dental materials curriculum as an example, SDS 261 offered in the third semester of the curriculum. SDS 261 is presented in the fall semester of the year to students who attained their third semester level in the fall. The same course is offered again in the winter semester of the year to students who attained their third semester level in the winter. Thus, the course is offered twice for the males and twice for the females during the same academic year. In the same manner, the faculty are teaching each required dental course four times a year.

Materials for Computing Workload:

To arrive at equitable workload among college faculty, all the material needed is the teaching program of the college and the number of its teaching staff. These requirements are, fortunately, readily available. There are, however, some justifiable considerations, that may make the availability of the required material less than straight forward. For example, what constitutes a full time faculty member, how would one deal with elective teaching load that is offered in certain semesters but not in others, how would one account for work load

required from a faculty member in a given department but of a nature other than teaching such as serving or chairing a committee, how would one account for faculty practice time, for research time and for teaching activity preparation time.

These complicating factors can be dealt with readily but will vary from a college to another. For KSUCD, these areas are dealt with as following:

Full time faculty member: is a faculty staff who is available five full days per week within the college and his expertise level permits him to carry normal teaching load. In KSUCD, since a demonstrator carries only half of the teaching load, in terms of number of students supervised, each two demonstrators will be considered equivalent to one full time faculty member. A department with twelve faculty members and four demonstrators will be considered as a department housing fourteen faculty members ($12 + 4/2 = 14$).

Elective courses: is given the same teaching credit as required courses provided that the elective course has been active with an acceptable number of students enrolled over a period of three consecutive semesters or two consecutive years.

Committee workload: Depending on the nature of the committee and the level of its activity, the Dean authorizes the appropriate work credit to the faculty involved. At KSUCD, the Dean, Vice-Deans, Department Chairperson, Director of Research Center, and Director of Dental Graduate Education, are expected to teach half of the maximum teaching load. Naturally, members of committees are also given work credit for their participation by assuring that such work load is evenly distributed among college faculty and all of them have adequate "uncommitted time" to meet the work needs. Committee work credit is regulated by the Dean.

Faculty practice time: Depending on the college structure, the practicing faculty are given work credit for patient treatment. At KSUCD, each faculty member treats patients one half day per week, few faculty do not treat patients and a few faculty treat patients more than one half day per week. The proposed system is flexible enough to allow for such variations and give appropriate work credit to the department concerned.

Research time: Research is a very important component for full time faculty members and full work credit must be given. The problem is that

some faculty members are allowed research time but do not use it effectively so that they cannot substantiate that they used the time for research. This issue ought not be of major concern to the college administration since an academic appointment implies the privilege to do research and without doing research a faculty member has already been punished by not being promoted. Thus, most colleges allow time for each faculty member to do research. At KSUCD, each faculty member is permitted one full day per week for research and professional development activities.

Method for Computing Workload:

Tables 1 to 4 list the required curriculum for each of KSUCD departments. The credit hours for each course are identified as lecture, practical or clinical.

Table 1. Required curriculum by BDS Department

SEN	Course #	Course	Hrs	Credit		
				Let	Prac	Clin
2	153	BDS Oral Biology (2)	2	2	0	0
3	241	BDS Oral Radiology 1	1	1	0	0
3	211	MIC Microbiology and Immunology	3	2	1	0
	244	Patient Exam and Assessment	2	1	0	1
3	245	BDS Physics of Oral Radiology	1	1	0	0
4	211	BDS Surgical Anatomy and Local Anaesthesia	1	1	0	0
4	212	BDS Applied Surgical Anatomy and Exodontia	1	1	0	0
4	231	BDS Oral Pathology	4	3	1	0
5	311	BDS Patient Assessment and Exodontia	2	1	0	1
5	341	BDS Oral Radiology (2)	2	1	0	1
5	342	BDS Oral Diagnosis	2	1	0	1
6	312	BDS Oral Surgery Technique in General Practice	2	1	0	1
7	411	BDS Oral Surgery	1	0	0	1
8	421	BDS Oral Medicine & Diagnosis	2	1	0	1
8	441	BDS Oral Radiology (3)	1	0	0	1
8	421	MIC Clinical Microbiology	1	0	1	0
9	499	BDS Surgery Comprehensive	1	1	0	1
		TOTAL	30	18	3	9

Actual Work Load:

Lectures	=	18 clock hours
Labs = 3 x 2.5 hrs. ea. x 4 fac. ea.	=	30 clock hours
Clinics = 9 x 3 hrs. ea. x 4 fac. ea.	=	108 clock hours
Department work load for one dental building	=	156 clock hours
Department work load for both dental buildings 156 X 2	=	312 clock hours

cal. At the bottom of each table, the total number of each type of credit hour is listed. Up to this point in computation, the matter is simple, but it is the computation that follows that will truly determine the workload.

Each lecture credit hour is one clock hour, hence for BDS, the 18 lectures constitute 18 man-clock hours since each of these clock hours require only one faculty member, the lecturer.

Each practical credit hour is 2.5 clock hours, hence for BDS, the 3 practical credit hours constitute 7.5 clock hours; each of these clock hours require four faculty members (to maintain a ratio of one faculty to six students in a class of 24 students). Thus, the 3 practical credit hours of BDS require 30 man-clock hours.

Each clinical credit hour is 3 clock hours, hence, for BDS, the 9 clinical credit hours constitute 27 clock hours; again each of these clock hours require four faculty members (to maintain a ratio of one faculty to six students in a class of 24 students). Thus, the 9 clinical credit hours of BDS require 108 (9X3x4= 108) man-clock hours. Hours of work per week for BDS is: 18 + 30 + 108 = 156 man-

Table 2. Required curriculum by SDS Department

SEN	Course #	Course	Credit			
			Hrs	Lec	Prac	Clin
3	261	SDS Dental Materials (1)	1	1	0	0
3	241	SDS Introduction to Dentures	3	1	2	0
3	263	SDS Dental Materials (3)	1	1	0	0
4	262	SDS Dental Materials (2)	1	1	0	0
4	242	SDS Complete Denture Construction	3	1	1	1
4	251	SDS Partial Denture Technique	3	1	2	0
5	351	SDS Clinical Prosthodontics (1)	3	1	1	1
5	353	SDS Clinical Removable Prosthodontics	2	0	1	1
7	451	SDS Clinical Removable Prosthodontics	1	0	0	1
8	486	SDS Maxillofacial Prosthodontics	2	1	0	1
9	499	SDS Comprehensive	2	0	1	1
TOTAL			22	8	8	6

ACTUAL WORK LOAD:

Lectures	=	8 clock hours
Labs = 8 X 2.5 hrs. ea. X 4 fac. ea.	=	80 clock hours
Clinics = 6 X 3 hrs. ea. X 4 fac. ea.	=	72 clock hours
Department work load for one dental building	=	160 clock hours
Department work load for both dental buildings 160 x 2	=	320 clock hours

clock hours. This number must be doubled since the same amount of activity is also done during the same week for the female students; hence, the teaching work per week for BDS is 312 man-clock hours.

The same computation is used to determine that the teaching work per week in terms of man-clock hours for the other three departments is 320 SDS, 342 PDS and 490 RDS. The total teaching work *per* week in terms of man-clock hours for KSUCD is: BDS 312 + PDS 342 + SDS 320 + RDS 490 = 1,464 man-clock hours per week. Table 5 shows the number of faculty members in each department, the total for the college is 80.5 faculty members (one demonstrator is equal to 0.5 faculty member). An equitable teaching load per faculty is then readily calculable as:

1,464 Hrs. ÷ 80.5 Faculty = 18.18 hours per faculty per week. Thus, a faculty member at KSUCD who is engaged in teaching activities far

Table 3. Required curriculum by PDS Department

SEN	Course #	Course	Credit			
			Hrs	Lec	Prac	Clin
4	211	PDS Introduction to Preventive	2	1	0	1
5	311	PDS Periodontium in Health and Disease	2	1	0	1
5	241	PDS Introduction to Pedodontics	1	0	1	0
6	312	PDS Clinical Periodontics	1	0	0	1
6	341	PDS Clinical Pedodontics (1)	2	1	0	1
7	411	PDS Advanced Periodontal Therapy	2	1	0	1
7	342	PDS Clinical Pedodontics(2)	1	1	0	7
7	331	PDS Orthodontic Technique	1	0	1	0
8	412	PDS Advanced Periodontal Therapy (2)	1	0	0	1
8	431	PDS Clinical Orthodontics	2	1	0	1
8	441	PDS Clinical Pedodontics(3)	1	0	0	1
9	421	PDS Community Dentistry and Dental Jurisprudence	2	1	1	0
9	442	PDS Clinical Pedodontics(4)	1	0	0	1
9	451	PDS Occlusion-Natural Dentition	1	1	0	0
9	499	PDS Comprehensive	2	1	0	1
TOTAL			23	9	3	11

ACTUAL WORK LOAD:

Lectures	=	9 clock hours
Labs = 3 X 2.5 hrs. ea. = 4 fac. ea.	=	30 clock hours
Clinics = 11 X 3 hrs. ea. = 4 fac. ea.	=	132 clock hours
Department work load for one dental building	=	171 clock hours
Department work load for both dental buildings 171 x 2	=	342 clock hours

Table 4. Required curriculum by RDS Department

SEM	Course #	Course	Credit			
			Hrs	Lec	Prac	Clin
1	183	RDS Introduction to Dentistry	1	1	0	0
1	112	RDS Denta! Morphology	2	1	1	0
2	111	RDS Introduction to Operative Dentistry	1	0	1	0
3	211	RDS Principles of Operative Dentistry (1)	4	2	2	0
4	212	RDS Principles of Operative Dentistry (2)	3	1	2	0
4	231	RDS Fixed Prosthodontics (1)	2	1	1	0
5	232	RDS Fixed Prosthodontics 21	2	1	1	0
333		RDS Precision Casting Methods	2	1	1	0
334		RDS Pins in Casting Restorations	1	1	0	0
5	311	RDS Restorative Procedures (1)	2	1	0	1
6	312	RDS Restorative Procedures (2)	1	0	0	1
6	321	RDS Pulp Biology and Indications for Treatment	3	2	1	0
7	411	RDS Restorative Procedures (3)	1	0	0	1
	436	RDS Advanced Ceramics	1	1	0	0
7	331	RDS Fixed Prosthodontics (3)	3	1	1	1
7	421	RDS Clinical Endodontics	1	0	0	1
a	412	RDS Restorative Procedures (4)	1	0	0	1
8	431	RDS Fixed Prosthodontics (4)	2	0	0	2
9	432	RDS Fixed Prosthodontics (5)	1	0	0	1
9	499	RDS Comprehensive	2	1	0	1
	TOTAL		36	15	11	10

ACTUAL WORK LOAD:

Lectures	=	15 clock hours
Labs = 11 X 2.5 hrs. ea. X 4 fac. ea.	=	110 clock hours
Clinics = 10 X 3 hrs. ea. X 4 fac. ea.	=	120 clock hours
Department work load for one dental building	=	245 clock hours
Department work load for both dental buildings 245 x 2	=	490 clock hours

removed from 18 hours per week is either overloaded or underloaded. This amount of teaching load is quite respectable since it is equivalent to delivering eighteen lectures per week by a faculty member of one of the theoretical colleges. The remaining of the work hours per week are then available for preparation, research and service activities.

Discussion

Table 6 shows the actual teaching work load per faculty member in each department of KSUCD as compared to the computed equitable teaching

load per faculty member in the college (1988/ 1989). The table indicates that while the faculty of RDS, BDS, and SDS are overloaded with their teaching activities, the faculty of PDS are under-loaded. The RDS faculty teaching load is 6.2% heavier than the equitable load, the BDS faculty teaching load is 7.3% heavier than the equitable teaching load, and the SDS faculty teaching load is 10% heavier than the equitable teaching load. On the other hand, the faculty of the PDS Department are enjoying a teaching load 18% lighter than the equitable teaching load. The total of shortage of RDS + BDS + SDS can be computed based on man hours to be 79 hours [(RDS 25.5 X 1.13) + (BDS 16 x 1.32) + (SDS 16 X 1.82) = 79.05 hours]. In other words, one can state that these three departments are short 4.4 faculty members (79/18.18 = 4.4). The surplus in faculty in the PDS Department can be computed as 76 man-hours or 4.2 faculty members – clearly the shortage in the former three departments is the surplus in the latter department when equitable distribution of work load is considered.

An important concept is for college administrators to assign each department a number of faculty members who, on the average, will be equitably loaded. Given its fair share of faculty members, a department will then be held responsible for

Table 5. Number of Faculty*

Department	Faculty	Demos	Total
RDS	21	11	25.5
PDS	19	8	23
BDS	14	4	16
SDS	14	4	16
Total			80.5

*Academic Year 1988/89

Table 6- Teaching workload per faculty.

Dept	Teaching Hrs	No. of Faculty*	Actual Teaching Hrs	Equitable Teaching Hrs/faculty	Surplus/ deficiency (-) inteaching Load/ Faculty
RDS	490	25.5	19.21	18.18	1.13(6.2%)
PDS	342	23	14.87	18.18	-3.31 (-18.2%)
BDS	312	16	19.5	18.18	1.32(7.3%)
SDS	320	16	20.00	18.18	1.82(10%)

*Including Demonstrators

equitable productivity in teaching, research and services. Variations in these activities from an individual faculty member to another within the department, based on their specific areas of strength, are natural and acceptable.

Conclusions

1. The proposed method is simple and requires the use of standard information available in any College of Dentistry.
2. The method is helpful in detecting the validity of assigning additional faculty members to departments within the college based on statistics of the teaching program.
3. The method indicates that assigning faculty members to departments based on number of courses or number of credit hours of courses is invalid; the actual teaching load in clock hours appears to be an equitable method for assigning faculty to departments.

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