

EVALUATION OF FACULTY SERVICE LOAD  
IN THE TEACHERS COLLEGE

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## PREFACE

One of the most important and, at the same time, one of the most difficult functions of the college dean is the proper evaluation of the service load carried by each member of his faculty. Traditional methods of measurement do not satisfy either the instructor or the administrator, because they do not consider numerous factors which are known to contribute to the time which the college teacher devotes to his work.

Administrators are quite aware of the inadequacy of these methods and of the dissatisfaction resulting from their use, but attempts to remedy the situation have brought few, if any, effective improvements. The purpose of this study is to provide the dean of the teachers college with a statistically sound method of evaluation, which, in the light of accepted principles and practices, will adequately consider all pertinent factors that are likely to contribute to faculty service load.

I wish to express my indebtedness to the members of my advisory committee, particularly to Dr. Ware Marsden and to Dr. Howard Heding, for the very valuable guidance and assistance which they provided. Also, I am deeply grateful to Dr. John Hamblen, Director of the Computing Center at Oklahoma State University, for the service he provided. This service saved me many hours of tedious statistical tabulation and computation.

Most of all, I wish to acknowledge the help and splendid cooperation given by the many deans and instructors who participated in this study.

Without their interest and willingness to participate, the investigation would have been impossible.

Finally, I wish to give recognition to my wife, Mary Helen, for her never failing encouragement and understanding throughout the development of this thesis.

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## CHAPTER I

### THE PROBLEM

Proper evaluation of faculty service load lies at the very center of all effective educational planning. In the first place, it is basic to the wise expenditure of public funds devoted to instruction.<sup>1</sup> Only as the administrator is able to evaluate properly the services rendered by a teacher is he able to calculate intelligently the cost commensurate with such services.

Secondly, proper evaluation is desirable for the purpose of effectively distributing faculty duties and responsibilities. This, according to Yeager, is the most important administrative function in a school.<sup>2</sup> A sincere effort on the part of a dean to divide equally the over-all load of an institution does much to reduce strain, encourage cooperation, and improve morale on the part of his faculty.<sup>3</sup> It should also lead to an economy of time, because proper evaluation implies uniformity of method--with due allowance for individual application, of course--and uniformity

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<sup>1</sup>S. P. Capen and E. B. Stevens, Report of A Survey of the University of Nevada, Bureau of Education, Bulletin No. 19 (Washington, 1917), p. 100.

<sup>2</sup>William A. Yeager, "The Service Load of Faculty Members in Education," Education Research Bulletin, XXXV No. 2 (1956), p. 40.

<sup>3</sup>H. H. Davis, "Organization of the Faculty for Effective Instruction, Student Relations, and Research," The Administration of Higher Institutions Under Changing Conditions (Proceedings of the Institute for Administrative Officers of Higher Institutions, XIX, 1947), p. 89.



of method should facilitate the making of faculty assignments.

Equitable adjustment of faculty service loads, in turn, does much to promote educational efficiency. It tends to prevent overloading of the individual. Quite obviously, overloading is to be avoided, because it leads to dilution of teaching effectiveness or injury to the teacher's health or both.<sup>4</sup>

Finally, proper evaluation of service load is necessary for purposes of acceptable educational publicity. Improper indexes for measuring load, such as the bare number of hours a teacher spends in the classroom per week, result in distinct misconceptions and lack of appreciation on the part of the college patron as to the actual amount of time the instructor devotes to his job.<sup>5</sup>

Clearly, guesswork in the matter of faculty work assignments can only lead to misunderstanding, ill feeling, waste, and inefficiency.

#### Purpose of the Study

Stimulated by the apparent validity and importance of the premise that proper evaluation of faculty service load is basic to effective educational planning, the writer became interested in and very much concerned about the answers to the following questions:

1. Can a satisfactory technique, objective in its application, be developed for properly evaluating the service load? That is, can a

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<sup>4</sup>A. J. Bjork et al., "The Evaluation of Faculty Services," American Association of University Professors Bulletin, XXXIV (1948), p. 567.

<sup>5</sup>Fred C. Ayer, "How the Teaching Load is Handled in State and Other Universities," The Nations Schools, III (June, 1929), p. 22.

technique which adequately considers all the factors that contribute appreciably to service load be devised?

2. Could such an instrument be depended upon to give accurate and consistent measurements?

3. What are the implications for administrative practice that will come out of a study of faculty service load in college?

In so far as the method of attack will permit, it is the purpose of this study to solve these problems. More specifically, the purpose of this investigation is to provide a formula for objectively and accurately measuring the service load of the faculty member in a teacher education institution.

#### Justification of the Problem

Because of the ever-growing public school population, it is quite evident that America will continue to have increasing enrollments in her teachers colleges. It is admitted that, using present standards in the selection of college faculty, employment of adequate staff to keep pace with the swelling enrollments will be very difficult if not impossible.<sup>6</sup> It is suggested, however, that by proper evaluation and distribution of work loads, the colleges should be able to provide more creditable services to these incoming groups than now seems possible.

Because it has not appeared practical to obtain time records for the various activities performed by college instructors, except in intensive studies, simple measures have been traditionally employed in comparing

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<sup>6</sup>Margaret Clapp, "Major Problems in Higher Education," Educational Record, XXXV (1954), p. 8.

and assigning teaching loads. Credit hours, student hours, and class periods per week are examples of such measures. However, these are generally conceded to be unsatisfactory because they do not present the whole picture. Russell<sup>7</sup> and many others insist that traditional methods do not take into account numerous other factors such as level of instruction, research, and extra-curricular activities, which are known to influence the amount of time and energy which the teacher devotes to his work. Furthermore, in a recent study made by the Research Division of the National Education Association,<sup>8</sup> many participating teachers suggested the need of a formula or formulas for reducing total assignments of a teacher to a single figure which could be compared with similar figures for other teachers.

The increasing demands made upon college deans tend to make it more and more difficult for them to devote sufficient time to some of the details of instructional supervision, particularly to those affecting the equitable adjustment of faculty load. They are quite aware of and concerned about this problem and have made numerous attempts to remedy the situation,<sup>9</sup> yet these attempts seem to be lacking in effectiveness, or else they are too complicated to be workable.<sup>10</sup> If one dares to believe

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<sup>7</sup>John Dale Russell, "Service Loads of Faculty Members," Proceedings of the Institute for Administrative Officials of Higher Institutions, XVIII (1946), Ch. 8, p. 75.

<sup>8</sup>"Teaching Load in 1950," National Education Association Research Bulletin, No. 1, XXIX (February, 1951), p. 33.

<sup>9</sup>E. W. Anderson and R. D. Bennett, "Teacher Education - III. Staff," Encyclopedia of Educational Research, ed. W. S. Monroe (New York, 1950), p. 1389.

<sup>10</sup>A. S. Knowles and W. C. White, "Scientific Management as a Tool of College Administration," Journal of Higher Education, XI (1950), p. 133.

the report pertaining to measurement of service load made by a committee of the 1952 North Central Workshop on Teacher Education,<sup>11</sup> there still must be widespread discontent with the practices employed. In this same report the committee declares that there has been little research done to establish the validity of any of the techniques which have been employed.

Consequently, the investigator thinks it imperative that an attempt be made to provide the administrator of the teacher education college a statistically sound technique which will not only conserve time incident to the assignment of faculty work but will also reduce to a minimum the maladjustments in load which can be so destructive of faculty morale.

#### Scope of the Study

Because the duties, responsibilities, and interests of faculty members vary so widely among institutions of higher learning, it was decided to limit this investigation to teachers in colleges which have a common purpose and which operate under or are guided by a common set of accreditation criteria. Thus, the population for this study includes the faculties of only seventy-four selected teacher education institutions which are located in the geographical area served by the North Central Association of Secondary Schools and Colleges.<sup>12</sup>

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<sup>11</sup>"Measurement of Service Load," Reports of the Fifth Workshop On Teacher Education, Sponsored by the Committee on Institutions for Teacher Education of the North Central Association of Secondary Schools and Colleges and the University of Minnesota, ed. John E. Jacobs (Emporia, Kansas, 1952), pp. 99-110.

<sup>12</sup>Eight of the seventy-four selected colleges are not members of the North Central Association, but they do cooperate in studies with the North Central schools.

It is desired that the sample adequately represent every department of study and each level of experience, tenure, and rank to be found in these colleges. Even so, it was deemed wise to limit the population somewhat by excluding any staff member whose teaching load is less than half his full assignment. This excludes presidents, deans, registrars, business managers, and perhaps other administrators or supervisors. Inasmuch as their work is pretty well prescribed, it is assumed that their exclusion will not appreciably reduce the usefulness of the findings of this study.

#### Limitations

It is recognized and readily admitted that no system of evaluation has been found or is apt to be found which properly considers all the factors which contribute to the service rendered by an instructor. Certain of them are so qualitative in nature that they defy measurement. Nevertheless, it seems fair to assume that some plan which considers and properly weighs those variables which can be measured would be a step in the right direction.

As stated in the report of the Fifth Workshop,<sup>13</sup> one of the reasons for the difficulty in comparing total service loads is that the college professor, because of the nature of his work, has not been required to maintain a regular time schedule. It is admitted, therefore, that this attempt to calculate service load is an effort to make a reasonably accurate estimate of the total hours which the individual should spend, rather than an estimate of time he actually spends, on the job. The writer in no

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<sup>13</sup>Reports of the Fifth Workshop on Teacher Education, p. 99.

way presumes to question the integrity of the participants in this study and is confident that the findings will be as valid and as worthwhile as if the professor did "punch the time clock."

#### Clarification of Terms

What is service load? Douglass and others,<sup>14</sup> in reviewing the literature pertaining to this subject for the Encyclopedia of Educational Research, indicate that the service load is generally understood to include all the activities which take the time of the teacher and which are related directly or indirectly to his professional duties, responsibilities, and interests. Teaching load refers only to those tasks relating to preparation, presentation, and evaluation of classwork. Other factors such as office routine, committee work, conferences, and research are classed as parts of the non-teaching load. The elements most often mentioned in the literature as being contributing factors to the service load will be listed in Chapter II of this thesis.

In view of the many variables which seek recognition, the choice of a unit of measure and of a criterion for weighing the service load presents some difficulty. Scroggs<sup>15</sup> insists that the index which adequately measures the load of the teacher must be comparable, combinable, comprehensible, sensitive, functional, direct, and simple. The clock hour per week more nearly satisfies all these criteria than any other unit.

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<sup>14</sup>H. R. Douglass, S. Romine, and W. T. Gruhn, "Teaching Load," Encyclopedia of Educational Research, ed. W. S. Monroe (New York, 1950), p. 1454.

<sup>15</sup>Schiller Scroggs, "A Survey of Proposed Units for Measuring Service Loads in Institutions of Higher Learning," Oklahoma Agricultural and Mechanical College Bulletin, No. 10 (Stillwater, 1932), p. 3.

Hence, for purposes of this investigation, service load is defined as the total number of clock hours per week which the faculty member devotes to his job.

As a criterion for determining this load, the arithmetic average between the instructor's<sup>16</sup> estimate and an estimate provided by the dean of his college has been chosen. It is assumed that the dean has knowledge of and much interest in the effort and accomplishments of each faculty member. His estimate should serve as a logical check to balance the possible tendency on the part of the instructor to over-estimate or under-estimate his own load.

#### Restatement of the Problem

Proceeding on the assumption that the arithmetic average between the instructor's estimate and the dean's estimate is a valid criterion by which to determine the service load of a faculty member in a teacher education institution, the problem becomes one of devising a formula by which this index can be accurately predicted. As stated before, this formula must consider all those factors which are likely to contribute significantly to time spent on the job and which do not defy measurement.

#### A Preview of the Plan of Attack

A review of related research found in the literature pertaining to this problem and a preliminary study of service load made at the writer's own college revealed several attempts at and contributions toward its

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<sup>16</sup>In this study, the words "teacher," "instructor," and "professor" are used synonymously, except when specifically referring to rank.

solution. Specifically, these sources supplied: (1) an enumeration of those factors which are thought to deserve consideration, and (2) certain principles which are deemed essential to the proper selection and weighting of these factors which contribute significantly to the total load.

In accordance with these principles, a logical hypothetical formula has been developed and an experiment designed to check its applicability and to statistically prove its acceptability.

In the following chapters of this thesis, the reader will find a partial review of the literature, a statement and interpretation of the formula, a description of the experimental design, a statistical treatment of the data, and certain conclusions and implications.



## CHAPTER II

### A PARTIAL SURVEY OF THE RELATED LITERATURE

Numerous studies pertaining to the general problem of the service load in education institutions have been reported. The abundance of this material imposes the necessity of confining this review to reports bearing most directly on the problem under investigation.

The purpose of this chapter is to make available to the reader information relative to the following questions:

1. What elements are most commonly suggested as deserving consideration in determining the service load of the college teacher?
2. What practices have been traditionally employed in measuring this load? What are the objections to these practices?
3. What attempts at a more satisfactory solution have been made? In what respects are these attempts inadequate or unacceptable?
4. What principles should be observed in computing and in assigning the service load in a teachers college?

#### Factors Contributing to Service Load

Many listings of elements which are deemed essential to the proper calculation of the total service rendered by the college teacher are to be found in the literature. Some are rather short and emphasize only the more time-consuming factors; others are very long and detailed with each item of major importance further defined and explained by one or

more sub-items of lesser importance.

McMullen,<sup>1</sup> Reeves and Russell,<sup>2</sup> Brown and Fritzemeier,<sup>3</sup> Bjork et al.,<sup>4</sup> Scroggs,<sup>5</sup> Lyon,<sup>6</sup> Young,<sup>7</sup> Randolph,<sup>8</sup> and others have submitted very comprehensive lists of contributing factors, of which the most frequently mentioned are:

1. Time spent in the classroom
2. Time required for preparation
3. Time used in evaluating students' work
4. Number of students in each class
5. Level of instruction
6. Number of concurrent sections of courses taught by one person
7. Number of new courses taught by the individual instructor
8. Method of presentation

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<sup>1</sup>L. B. McMullen, The Service Load in Teacher Training Institutions of the United States (Contributions to Education, No. 244, Teachers College, 1927), p. 87.

<sup>2</sup>F. W. Reeves and J. D. Russell, "The Instructional Load," College Organization and Administration (Indianapolis Board of Education, Disciples of Christ, 1929), p. 168.

<sup>3</sup>E. J. Brown and L. H. Fritzemeier, "Some Factors in Measuring the Teacher's Load," Educational Administration and Supervision, XVII (1931), p. 64.

<sup>4</sup>Bjork et al, p. 572.

<sup>5</sup>Scroggs, p. 22.

<sup>6</sup>L. H. Lyon, "A Plan for Evaluation of Teacher Load," California Journal of Secondary Education, XX (1945), p. 348.

<sup>7</sup>Lloyd P. Young, "Service and Teaching Loads in Our Member Institutions," The American Association of Colleges for Teacher Education, Second Yearbook, (1949), p. 45.

<sup>8</sup>V. R. Randolph, "Professor's Weekly Work Hours," School and Society, LXXII (September, 1950), p. 202.

9. Time needed to confer with students
10. Time spent in meetings--faculty, committee, and departmental
11. Time devoted to office work--clerical and administrative
12. Rank
13. Time given to research and creative activity
14. Time allotted to professional reading and professional groups
15. Time spent in public relations work.

Undoubtedly, many will contend that the most significant factors which deserve consideration in evaluating service rendered by the professor are: (1) a rich, cultural background; (2) a personality which stimulates the alert mind of the scholar; (3) interest in and knowledge of the subject taught; (4) uniqueness and effectiveness of methods used; (5) moral and professional integrity; and (6) an abiding concern about individual students and their needs.<sup>9</sup>

There is no argument against the importance of such factors in truly evaluating the success of a teacher, and consequently the relative value of such factors in determining service rendered, but, as stated before, it is intended in this study to include only those factors which do not defy measurement. As Michell says, in referring to factors similar to those just listed, "Such enrichment defies analysis in terms of clock hours per week and should be considered one of the main reasons why the working week of the college professor should not be so heavy as that of the commercial employee."<sup>10</sup>

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<sup>9</sup>S. F. Anderson, "Why Don't I Do Research?" American Association of University Professors, Bulletin No. 40 (Spring, 1954), pp. 472-479.

<sup>10</sup>Elene M. Michell, "Need for Time Analysis of Instruction," Journal of Higher Education, VIII (1937), p. 312.

### Traditional Practices

The most common measures of teaching load used in institutions of higher learning are the credit hour and the class period.<sup>11</sup> A traditional standard employed by accrediting agencies for approving colleges has been the maximum of sixteen hours per week of teaching for each member of the faculty.<sup>12</sup> Partly as a result of such a standard, it has become common practice to use sixteen credit hours as a "regular" teaching assignment.<sup>13</sup> Little has been done to prove or disprove the validity of this unit as an index for measuring teaching load, but it is known that many teachers and administrators are not satisfied with it.<sup>14</sup> The credit hour does not consider such pertinent factors as actual time spent in class, time for preparation and evaluation, number of students, level of instruction, or number of concurrent sections, all of which are commonly listed as contributing significantly to the service load. In fact, as Anderson relates, a so-called fifteen-hour assignment often entails over eighty hours of actual load.<sup>15</sup>

Some studies have indicated that the weekly time of the college teacher is divided approximately two-thirds for instructional duties and

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<sup>11</sup>Douglass, Romine, and Gruhn, p. 1454.

<sup>12</sup>M. E. Haggerty, The Evaluation of Higher Institutions, Volume 2 - The Faculty, (Based on Investigation Conducted by Committee on Revision of Standards, Committee on Higher Institutions of the NCA), University of Chicago Press, 1937, p. 144.

<sup>13</sup>Michell, p. 311.

<sup>14</sup>Bjork et al, p. 567.

<sup>15</sup>Anderson, p. 478.

one-third for non-instructional duties.<sup>16,17</sup> They report also that for most professors the time devoted to instruction is divided about equally between actual teaching and preparation. Using this as a basis, attempts have been made to estimate total load by use of a three-to-one ratio to be applied to semester hours of credit assigned.<sup>18</sup> However, Knowles and White<sup>19</sup> found that the ratio of total time required to semester hours of credit assigned varies from 2.9 to 5.5, and that time requirements do not correspond with credit hours involved.

The class period was used as the unit of load in the National Survey of the Education of Teachers.<sup>20</sup> Ignoring adjustments for any special methods of presentation, the median load of college and university professors in 1930-1931 was reported, by this survey, to be fifteen teaching clock hours per week, with a range from one to more than thirty-five. Immediately, one wonders what other services, if any, were rendered by individuals at the different extremes of the sample used in the survey which could possibly have equated their total loads. In other words, clock hours of teaching alone give a very incomplete picture of the instructor's entire load. Many agree with Foley<sup>21</sup> that "something more

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<sup>16</sup>E. S. Evenden, G. C. Gamble, and H. G. Blue, "Teacher Personnel in the United States," National Survey of the Education of Teachers, Vol. II, U. S. Office of Education, Bulletin No. 10, (Washington, 1933), p. 191.

<sup>17</sup>W. H. Conley, "Junior College Instructor," Junior College Journal, IX (1939), p. 509.

<sup>18</sup>Knowles and White, p. 131.

<sup>19</sup>Ibid.

<sup>20</sup>Evenden, Gamble, and Blue, p. 181.

<sup>21</sup>A. L. Foley (Chm.), "Report of the Committee on Teaching Load in Colleges," North Central Association Quarterly, IV (1929), p. 257.

than a printed program of classes is necessary in order to gauge justly a teacher's work."

Accrediting agencies have also been concerned with the ratio of the number of students to the number of teachers as an index of faculty load. The average student-faculty ratio in North Central colleges in 1941 was thirteen to one.<sup>22</sup> The supposition is that the lower this ratio, the greater the efficiency of the school. Consequently, many colleges have become quite conscious of the student contact hour as a basis for calculating load. This measure involves the simple multiplication of the number of students in each class by the number of hours per week the class meets. Its use is based on the assumption that there is a direct relation between number of students in a class and the teaching burden. Yet a survey conducted at the University of Chicago in 1933 showed little correlation between class size and burden of teaching.<sup>23</sup> On the other hand, Koos<sup>24</sup> found that class size is a factor to be considered, but that the extent of its influence is limited. In practice, the number of student contact hours varies from eighty in some graduate schools to four hundred or even to one thousand in some undergraduate schools.<sup>25</sup> Too many uncontrollable factors make the sole use of this unit undesirable.

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<sup>22</sup>Revised Manual of Accrediting, North Central Association, 1941, p. Faculty 5.

<sup>23</sup>F. W. Reeves and Others, "The University Faculty," University of Chicago Survey, Vol. III (University of Chicago Press, 1933), cited by Douglass, Romine, and Gruhn, p. 1458.

<sup>24</sup>L. V. Koos, The Adjustment of the Teaching Load in a University, U. S. Bureau of Education, Bulletin No. 15 (Washington, 1919), p. 44.

<sup>25</sup>Young, p. 46.

Many administrators have attempted to make allowances for some of the variables mentioned earlier, by assigning weights to certain factors. Through the years, this has been done with respect to the method of presentation. A weight of one to a lecture period and from one-half to one for a laboratory period is common practice, with some schools distinguishing between laboratory and activity periods also. Lindsay and Holland<sup>26</sup> assert that it was not unusual in 1930 for American institutions of higher learning to allow the instructor "one teaching load hour for each hour spent in recitation, one-half teaching load hour for each hour spent in the laboratory, and one and one-half teaching load hours for each hour spent in lecture." This is based on the assumption that the amount of preparation required for each hour of classwork varies considerably with the method of presentation employed. Although generally accepted, it is not wholly agreed that this is a valid assumption. For instance, Nicholson<sup>27</sup> declares that "the clock-hour: credit-hour ratios of 3:2 and 4:3 are not popular in college chemistry instruction,"

#### Attempts at Improvement

L. V. Koos<sup>28</sup> developed one of the first scientific methods for adjusting the teaching load at the college level. This method considers: (1) mode of presentation, (2) experience of the teacher, (3) nature of the subject, and (4) level of instruction. On the basis of a load study

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<sup>26</sup>E. E. Lindsay and E. O. Holland, College and University Administration (New York, 1930), p. 445.

<sup>27</sup>D. G. Nicholson, "College Teaching Loads, 1951-1952," Journal of Chemical Education, XXX (1953), p. 150.

<sup>28</sup>Koos, pp. 1-63.

made at the University of Washington in 1919, Koos prepared tables of weighted values to adjust for differences in these four factors. He found that the average teaching load for a five and one-half day week required thirty-three hours, plus an additional eleven hours for the non-instructional duties. With knowledge of the four elements Koos considers, the administrator can obtain from the table of weighted values a constant, which, when divided into thirty-three, yields the number of teaching hours to which the instructor should be assigned.

Although it is admitted that this method was developed quite scientifically and could probably be applied with a high degree of accuracy, providing the table of weighted values were revised frequently, the labor involved in keeping the table currently applicable and the fact that the method actually considers only four factors would seem to limit its acceptability and usefulness to both teachers and administrators.

A formula for measuring load, developed by Kelly<sup>29</sup> in 1926, is based on the belief that differences in the time required for the preparation and administration of classwork in the various subjects constitutes the chief factor in creating inequalities in the teaching load. His indexes of preparation are based on ratings provided by a limited number of university deans. The four factors which he considers are: (1) the extent of new study and preparation required, (2) the extent of review, outline work, and preparation of materials required for regular meetings of the class, (3) the extent of labor involved with student manuscripts, notebooks, and the like, and (4) the extent of time required for individual

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<sup>29</sup>F. J. Kelly, "Relative Amounts of Time Required for Teaching the Different College Courses," Journal of Educational Research, III (1926), p. 277.



student conferences. The average weightings to be applied to these four factors Kelly found to be .30, .28, .25, and .17 respectively. From the deans' answers to his questionnaires, he prepared a table of average values for each factor in each subject field at three different levels of instruction. Before applying the formula which Kelly prepared, one must first find and multiply the tabular value for each of the four factors by its appropriate weight and add. This sum represents only the amount of time required for preparing to teach the designated course. Using this index of preparation and any previously agreed upon figure for total load, one can then apply the formula to determine the number of hours of teaching which should be assigned. His formula is:

$$H + \frac{I \times H}{5} = 45$$

where H represents hours of teaching per week, I is the index of preparation, and 45 is the agreed upon total weekly load.

Again, the number of factors considered by this method is rather limited. Such elements as the level of instruction, the number of duplicate sections, the number of students, and the many non-instructional duties are ignored. Also, the validity of a table of values prepared more than thirty years ago is questionable for use today.

Probably more than any other author, McMullen<sup>30</sup> is cited in the literature pertaining to faculty load in teachers colleges. Although he did not attempt to develop a formula, he did evolve a table of standards for class-hour and student-hour loads for various subjects taught in the teachers college. These standards are based on actual time records kept

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<sup>30</sup>McMullen, 97 pp.

by 1,956 instructors who were teaching in institutions belonging to the American Association of Teachers Colleges in 1926. They consider many sub-factors contributing to (1) class work, (2) preparation, (3) office routine, and (4) student relations, but exclude such elements as committee work, professional reading, research, and public relations. The norms are relatively easy to apply, once an over-all average load is decided upon. This total load was found to be forty-four hours in his study.

By revising McMullen's standards in accordance with present-day practices, one might find a relatively worthwhile, acceptable system for assigning load, except for the fact that, in addition to other items already mentioned, level of students, new classes, and duplicate sections are ignored.

The index of load developed by Reeves and Russell<sup>31</sup> in 1929 is the ratio of the instructor's load to that of the average for the college. It involves (1) teaching hours, (2) preparation hours, and (3) student hours. Using the individual opinions of instructors from Transylvania and Hiram colleges as a basis for weighting these three factors, the authors attempted to combine them into a formula yielding a single index. The preparation hour and the teaching hour were found to be considered equal in importance, while the student hour was given a weight equal to the other two combined. The Reeves and Russell formula is:

$$\frac{2S}{As} + \frac{P}{Ap} + \frac{T}{At} = I$$

where P stands for preparation time, T for teaching time, S for student

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<sup>31</sup>Reeves and Russell, pp. 178-180.

hours, and Ap, At, and As represent the average of each factor for the institution as a whole. Obviously, the index of load for the institution is four.

This formula is quite simple and easy to apply after the averages are compiled, but, as the authors admit, many factors are given scant attention and others are omitted entirely. The tendency for the individual professor to "pad" his report--with respect to preparation time--is apt to be great, particularly if he thinks his load might be increased as a result of the inquiry.

According to Ayer,<sup>32</sup> at the University of Texas in 1929 it was proposed that the following classes be considered financial equivalents:

1. Non-advanced--freshman or sophomore--classes with thirty students
2. Advanced--junior or senior--classes with twenty students
3. Graduate classes with eight students.

"Using these standards as a basis, by allowing one-sixth more credit for doubling the size of the class, and by making allowance for the increased difficulty of teaching advanced courses," Ayer proposed the following formulas for measuring and estimating the cost of the teaching load:

$$\begin{aligned} \text{Non-advanced} &= 25 + \left( 5 \times \frac{N}{30} \right) \\ \text{Advanced} &= 45 + \left( 9 \times \frac{N}{20} \right) \\ \text{Graduate} &= 35 + \left( 7 \times \frac{N}{8} \right) \end{aligned}$$

Even though these formulas may have served adequately the purpose for which they were intended, about which the writer could find no record,

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<sup>32</sup>Fred C. Ayer, "Computing and Adjusting the University Teaching Load," The Nations Schools, IV (July, 1929), p. 27.

they in no way satisfy the need for an instrument for equitably assigning faculty load. They only emphasize the importance which administrators have attached to number of students and to level of instruction in determining costs.

In 1945, Lyon<sup>33</sup> presented an evaluation plan to the faculty at San Francisco Junior College. It consists of a teacher-load chart to be filled out by the instructor and a system of weights to be applied by an evaluating committee. In completing the form, the instructor considers the following factors: enrollment; formal lecture hours; unsupervised laboratory, gym, and conference hours; new courses; meetings off the campus; paper-grading; number of advisees; and non-teaching duties. The system of weights was arbitrarily selected to give a maximum load of forty-five points.

Apparently the method is quite flexible and subject entirely to the judgment of the committee which applies it. This injection of the human element, Lyon claims, is necessary for the successful application of any plan. Although tentatively approved by the San Francisco college faculty, no report as to final acceptance or rejection seems to be available.

In 1948, a committee at the University of North Dakota<sup>34</sup> developed a plan "for establishing the weekly service load to include all services faculty members are expected to render to the institution." They prepared a "Basic Evaluation Sheet," on which each department evaluates each of its courses in terms of the average number of hours per week required of the teacher. At the beginning of each semester, the instructor fills

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<sup>33</sup>Lyon, pp. 346-349.

<sup>34</sup>Bjork et al, pp. 570-571.

out a "Semester Evaluation Sheet," which takes into consideration the course evaluations, the enrollment, and the assistance provided by the institution. This sheet yields the teaching load, to which are added hours allowed for research, administrative work, committee work, et cetera. The committee admitted that it would require much work to get the system established. They suggested, too, that an umpire of some sort would probably be needed "to moderate the excessive zeal of some departments."<sup>35</sup> A plan similar to the North Dakota plan has been developed and used at the California Institute of Technology.<sup>36</sup> Their schedule is called "Units for Faculty Duties."

Recently, Enochs<sup>37</sup> reported the evolution of a new staffing formula for institutions of higher learning in California. The basic idea of this formula is that it allows staff in relation to the total work load of the college. The total work load is divided by the work load per individual instructor to calculate the number of teaching positions needed for a particular college. In practice the formula looks like this:

$$N \text{ (total number of faculty) } = \frac{(Ca + Va) + (Cb + Vb)1.3 + (Cc + Vc)1.5 + (Cd + Vd)6 + (Ce + Ve)3}{12} + \frac{S}{I}$$

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<sup>35</sup>Ibid., p. 571.

<sup>36</sup>Ayer, The Nations Schools, IV, p. 27.

<sup>37</sup>J. B. Enochs, "What Factors Should Be Considered by an Institution in Determining Staff Needs," Current Issues in Higher Education (Association for Higher Education, Department of NEA), 1955, pp. 201-208.

Enochs interprets the formula as follows:

- C = approved courses;
  - Ca -- classes meeting one hour for one hour of credit,
  - Cb -- classes meeting two hours for one hour of credit,
  - Cc -- classes meeting three hours for one hour of credit,
  - Cd -- coaching major sports - more than three hours for one hour of credit,
  - Ce -- coaching minor sports or supervision of dramatic or journalism productions - more than three hours for one hour of credit,
- V = additional sections of approved courses;
- S = allowance for supervisory staff;
- 12 = faculty work loads in units of student credit, based on work week of 45 hours, described thusly;
  - 12 hours teaching plus 24 hours preparation, or
  - 18 hours teaching plus 18 hours preparation, or
  - 24 hours teaching plus 12 hours preparation, and
  - 9 hours advising, committee work, et cetera

Even though this formula has reportedly found favor in California for use in determining staff needs and instructional costs, Enoch points out that "it can lead to an undue proliferation of course offerings, if not accompanied by a sound plan of curriculum study."<sup>38</sup> For the typical teacher, it seems to include only (1) teaching hours, (2) preparation hours, and (3) nine hours for non-teaching duties. It does not consider enrollment, level of instruction, new courses, and rank. But it is indeed "a far cry" from the old student-teacher ratio method of describing staff needs.

In summarizing this portion of the review of the literature, it should be noted that only one of the methods described has been designed specifically for use in the teachers college. It is agreed that many of the problems pertaining to total load are common to all institutions of higher learning, but the degree to which each influences the total result may differ considerably. For instance, the teaching load, as

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<sup>38</sup>Ibid., p. 208.

measured in credit or teaching hours, has been traditionally heavier in the teachers college than in the university, while time devoted to research has been correspondingly lighter.<sup>39,40</sup>

It should also be noted that the number of significant factors considered by the several systems varies from one to more than ten, revealing differing philosophies and no particular agreement as to what makes up total service load. Very few of these systems have been validated statistically.

#### Facts and Principles to be Observed in Evaluating Faculty Service Load

The pertinent literature has been carefully studied in an effort to discover basic facts and sound principles upon which to establish logical hypotheses and procedures for the solution of this problem. These facts and principles consist mainly of significant findings, conclusions, and recommendations of interested research students, and are summarized as follows:

1. It is the responsibility of each member of a college faculty to carry a fair and equitable share of the total service load, with a reasonable attempt at successful fulfillment.<sup>41</sup>

2. A fair load in a teachers college is the average load carried in all teacher institutions--a standard set up by experience.<sup>42</sup>

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<sup>39</sup>Haggerty, p. 156.

<sup>40</sup>Foley, p. 250.

<sup>41</sup>Yeager, p. 40.

<sup>42</sup>McMullen, p. 70.

3. The instructor who is slower than average must expect to pay the penalty of his slowness in longer hours of work, whereas the one who is more rapid than average should have the margin of time which he gains to dispose of as he chooses.<sup>43</sup>

4. A figure between fifteen and sixteen credit hours per semester appears to best represent the average teaching assignment in teachers colleges.<sup>44,45</sup>

5. The maximum assignment for accreditation purposes usually reads: The average teaching load of the entire college should not exceed fifteen recitation periods of not more than sixty minutes each per week or its equivalent. Equivalence is based on the ratio of one class period in a recitation class to one and one-half periods in shop, laboratory, and physical education classes.<sup>46</sup>

6. In teachers colleges, the average number of clock hours spent in the classroom is 18.4 per week.<sup>47</sup>

7. In the smaller colleges, the average amount of time devoted per week to instructional duties is thirty-five hours, almost equally divided between classroom and non-classroom duties. In addition, the instructor averages more than sixteen hours in other duties pertinent to his job.<sup>48</sup>

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<sup>43</sup>Koos, p. 7.

<sup>44</sup>J. D. Messick, "Teaching and Service Loads of College and University Staffs," School and Society, LXIX (May, 1949), p. 335.

<sup>45</sup>Michell, p. 311.

<sup>46</sup>Young, p. 45.

<sup>47</sup>Haggerty, p. 156.

<sup>48</sup>Conley, p. 509.



8. The average total service load in teachers colleges is approximately fifty-two hours per week.<sup>49,50</sup>

9. In 1945 the departmental averages at one teachers college indicated a range in preparation time from 7.5 hours per week in Physical Education to 21.5 hours per week in Speech, with most departments centering around seventeen to eighteen hours.<sup>51</sup>

10. Much repetition of classes reduces the time needed to teach the repeated sections successfully. The duplicate section requires only two-thirds as much time as the original; demanding no time for preparation.<sup>52</sup>

11. While time required to prepare a lecture or class discussion is independent of enrollment, time for evaluation and student conferences varies directly with enrollment.<sup>53</sup> Student hour averages vary from 250 for Home Economics and Industrial Arts to 450 and 500 for Social Science, English, and Education. The mode is 350.<sup>54</sup>

12. Time needed for preparation is greater for the more advanced courses.<sup>55</sup> Consequently, the ratio of graduate to undergraduate teaching

<sup>49</sup>Young, p. 46.

<sup>50</sup>Randolph, p. 201.

<sup>51</sup>"Tentative Principles of Teaching and Service Loads of the Faculty of ISTC," Indiana State Teachers College, Committee on Problems of Faculty Load, 1945, 7 pp. (mimeo), cited by Douglass, Romine, and Gruhn, p. 1459.

<sup>52</sup>Knowles and White, p. 33.

<sup>53</sup>Lyon, p. 346.

<sup>54</sup>McMullen, p. 72.

<sup>55</sup>Koos, p. 37.

assignments, in terms of credit hours, usually approaches four to five.<sup>56</sup>

13. There appears to be little or no correlation between years of experience in teaching and time needed for daily preparation.<sup>57</sup> But, a new course places an added burden, and unless this is recognized, "the instructor is penalized for crawling out of his academic rut."<sup>58</sup> The new course requires from 1.5 to 2.5 times as much time for preparation as does one taught several times before.<sup>59</sup>

14. Greater teaching loads are customarily assigned to individuals of low rank, who are usually new instructors, because (1) they do not have as many committee assignments and advisory duties, and (2) they are assigned more elementary courses, which require less preparation.<sup>60</sup> The decrease in load is from one to two hours when raised to the rank of associate and another one to two hours when raised to a full professor. As much as five hours decrease is given the head of a department.<sup>61</sup>

15. Counseling is a very important aspect of college teaching. It may include: "(a) setting up student programs, (b) helping students over rough spots, (c) helping the student with social, economic, or behavior problems, and (d) giving the student individual instruction."<sup>62</sup> These

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<sup>56</sup>Yeager, p. 40

<sup>57</sup>McMullen, p. 90.

<sup>58</sup>Lyon, p. 347.

<sup>59</sup>Knowles and White, p. 132.

<sup>60</sup>Lindsay and Holland, p. 446.

<sup>61</sup>Ibid., p. 446-447.

<sup>62</sup>Yeager, p. 41.

conferences with students usually consume from four to five hours per week.<sup>63,64</sup>

16. Some of our best educational values are to be found in our extra-curricular activities. Most authorities agree that sponsorship of these should carry load credit.<sup>65</sup>

17. Every staff member should engage in some research activity to promote his own professional growth.<sup>66</sup> The teachers college instructor is reported to spend from two to four hours per week doing research.<sup>67</sup>

18. Each staff member should participate in professional activities which advance the profession on national, state, or local levels. The extent or level of such undertakings will depend upon his interests and qualifications, but every faculty member should do some service designed to improve his community.<sup>68</sup>

19. The balanced and effective distribution of assignments in terms of individual interests and competencies is the responsibility of the dean and/or the head of the department.<sup>69</sup>

20. The data necessary for scientific evaluations of faculty load are best obtained through the medium of the questionnaire. Both deans

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<sup>63</sup>Haggerty, p. 147.

<sup>64</sup>Randolph, p. 201.

<sup>65</sup>Lyon, p. 347.

<sup>66</sup>Yeager, p. 43.

<sup>67</sup>Evenden, Gamble, and Blue, pp. 186-187.

<sup>68</sup>Yeager, p. 43.

<sup>69</sup>Ibid., p. 40.

and teachers should be asked to cooperate.<sup>70</sup>

21. The method of measurement should produce a single figure that can be compared with similar figures for other teachers. This is the chief value of a formula.<sup>71</sup>

22. The instrument for measuring load should consider only amount of time involved, not quality of work done.<sup>72</sup>

23. Total service load should be measured in very simple units, intelligible to the public. They should be comparable, combinable, and comprehensible.<sup>73</sup>

24. The clock hour per week is most often recommended as the desirable unit for measuring load. Most institutions interpret the teaching clock hour as the teaching period--usually only fifty to fifty-five minutes in length--, rather than a full sixty-minutes of teaching.<sup>74</sup>

#### Summary

Although this review is far from exhaustive, it is inclusive enough to indicate the nature and extent of studies in the field of college faculty service loads and to exhibit experimental techniques generally employed.

Time for presentation, preparation, evaluation, conferences, office

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<sup>70</sup>Knowles and White, p. 134

<sup>71</sup>NEA Research Bulletin, No. 1., XXIX, p. 43.

<sup>72</sup>Norman Frost, "What Teaching Load?," American School Board Journal, CII (March, 1941), p. 43.

<sup>73</sup>Scroggs, p. 3.

<sup>74</sup>Randolph, p. 202.

work, meetings, research, professional reading, and public relations, plus such factors as number of students, level of instruction, duplicate sections, new courses, method of presentation, and rank, are the elements most often listed as deserving consideration in determining load.

Traditional practice has made much use of the credit hour, the student hour, and the teaching hour, for evaluating faculty load, but these are no longer acceptable to either teacher or administrator. Most investigators have concluded that future attempts at measuring and comparing faculty loads should be in terms of clock hours per week.

Several studies directed toward improving the system of evaluation of load by means of schedules of faculty duties, or tables of standard values, or formulas, have been made. Most of these have been too simple to be effective, or else too complex to be workable.

The literature contributes much in the way of basic facts and principles which should be observed in attacking a problem of this nature. These have been very helpful in guiding the present investigator.

## CHAPTER III

### DEVELOPMENT OF THE FORMULA

Two years ago, as chairman of a faculty committee, the writer was charged with the responsibility of directing a survey of faculty service load at Northeastern State College. The results of this preliminary study plus the many basic facts and principles revealed by a review of the literature have served as guides in establishing hypotheses leading to the development of a formula for properly estimating faculty load in a teachers college.

It is the purpose of this chapter to present: (1) a summary of the findings of the preliminary study, (2) a list of the assumptions upon which the formula is based, and (3) a statement and interpretation of the formula.

#### The Preliminary Survey

Following a great deal of discussion and a limited amount of research relative to the evaluation of faculty load, the committee prepared a rather detailed schedule of questions to determine how much time each faculty member devotes to his several duties and responsibilities. This questionnaire was presented to the faculty of Northeastern State College and each member was urged to complete it as quickly and as conscientiously as possible. Within a two-week period, fifty-eight schedules were returned and six were immediately discarded because the staff members

involved taught less than half-time. The committee agreed that to include these might tend to distort the findings. A summary of these findings is presented in Table I.

Upon comparing the results of this survey with the common practices revealed by the literature, one must conclude that Northeastern State College is quite typical of other teachers colleges in the nation with respect to faculty service load. The mean total load of 52.9 hours is only about one hour greater than that revealed by the literature. It will also be noted that the total load is divided almost equally among classroom duties, other instructional duties, and non-instructional responsibilities.

The average assignment of 14.6 semester credit hours is slightly less than the fifteen to sixteen hours usually reported, but the teaching hour load of 18.2 periods is almost the same as the national average. Although the time spent in preparation is less than the national mean, the time required for evaluation is sufficiently greater to make the sums of these two factors about equal. The student hour load of 384 is somewhat heavier than the norm of 350 quoted by McMullen,<sup>1</sup> but his study was made over thirty years ago and probably is not adequate for today's use.

Time devoted to student conferences at Northeastern State College is slightly lower, but time given to research and professional reading is correspondingly higher than averages revealed by the literature. Most other non-instructional duties receive about the same amount of time as that quoted by other studies, so that the non-instructional total of sixteen hours agrees exactly with the national norm for teachers colleges.

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<sup>1</sup>McMullen, p. 72.

TABLE I

AN ANALYSIS BY DEPARTMENTS OF THE FACULTY LOAD AT NORTHEASTERN STATE COLLEGE IN 1955-1956

Department	Number	Credit Hours	Student Hours	Teaching Hour Load				Other Instr. Duties			Non-Instructional Load					Total Load	
				Regular Classes	Laboratory Classes	Activity Classes	Total Class Periods	Preparation Time	Evaluation Time	Total	Office Routine	Extra-class Activities	Student Conference	Committee Work	Research, Prof. Edu.		Total
Art	2	15.2	322	13.0	4.0		17.0	9.5	6.0	15.5	2.5	2.0	5.5	3.0	4.0	17.0	49.5
Biology	3	15.2	408	12.2	7.4		19.6	11.0	8.8	19.8	1.5	1.0	2.7	1.6	5.0	9.3	50.7
Commerce	4	15.2	393	16.0			16.0	9.8	10.8	20.6	1.1	6.0	6.0	2.5	4.6	20.2	56.8
Educ.-Psy.	8	15.9	463	15.9			15.9	10.4	7.5	17.9	2.7	2.2	3.5	3.0	5.2	16.7	50.5
English	5	14.8	373	14.8	.8		15.6	17.0	14.0	31.0	.8	1.0	3.1	.8	9.2	14.9	61.5
Home Ec.	2	16.2	278	13.3	5.0		18.3	6.2	5.2	11.4	1.5	2.5	5.5	1.5	7.0	18.0	47.7
Ind. Arts	3	15.0	266	11.7	17.1		28.8	7.8	8.8	16.6	2.0	2.0	1.5	1.0	3.5	10.0	55.4
Lang.-Hum.	1	21.0	531	21.0			21.0	4.5	11.0	15.5	1.0	2.5	4.0	1.0	1.5	10.0	46.5
Math	2	18.0	568	18.0			18.0	8.7	12.5	21.2	3.0	2.0	8.0	2.2	4.0	19.2	58.4
Music	4	11.0	135	12.2		5.7	17.9	9.8	2.8	12.6	3.8	.8	4.3	1.1	6.3	16.3	46.8
Phys. Edu.	5	11.0	321	7.2		13.0	20.2	5.5	1.5	7.0	1.5	10.3	2.0	1.0	2.0	16.8	44.0
Phys. Sc.	3	16.3	450	14.0	8.0		22.0	15.0	13.7	28.7	2.5	1.0	3.1	.8	3.0	10.4	61.1
Sec. Sc.	7	14.4	505	14.4			14.4	13.4	5.9	19.3	2.6	2.6	3.6	2.5	7.2	18.5	52.2
Speech	3	14.0	303	14.7	7.0		21.7	13.7	5.9	19.6	1.0	3.2	5.0	1.0	6.7	16.9	58.2
Total	52	14.6	384	13.7	2.8	1.7	18.2	10.9	7.9	18.8	2.1	3.0	3.8	1.8	5.3	16.0	52.9



### Basic Assumptions

The administrator must know and understand the assumptions upon which the formula is based in order to appreciate fully and interpret properly the results obtained by it. The assumptions which follow have been formulated in accordance with principles and practices which have been found to have some bases for acceptance.

1. The typical instructor in the teachers college devotes approximately fifty-two hours per week to his job.

2. The ordinary class period in college, even though actually only fifty to fifty-five minutes in length, is to be interpreted as one full clock hour of service load. This statement holds, regardless of whether the period is spent in teaching a regular, laboratory, or activity type class. It is suggested that, even though the time may be used only in conversation, the few minutes between classes can never quite be called the instructor's own.

3. The typical class requires three-fourths as many hours per week for preparation as there are credit hours given in the course.

4. The time ordinarily spent in evaluation is one-half as many hours per week as the number of credit hours granted.

Assumptions three and four simply mean that a typical four-hour course requires three hours for preparation and two hours for evaluation each week. An ordinary sixteen-hour assignment requires twenty hours for these two factors, excluding variations due to duplicate sections, new classes, differences in enrollment, and differences in level of instruction.

5. Some courses require more time for preparation, per semester credit hour, than do others. It is assumed that the time necessary for

preparation and evaluation decreases as time required for presentation increases. For example, an eleven credit-hour load for activity type courses which meet two hours per week for each credit hour offered, or a thirteen credit-hour load for laboratory courses which meet one and one-half hours per week for each credit hour, is equivalent to a sixteen credit-hour load for regular courses, all other factors remaining equal. In each case approximately thirty-six hours are required for presentation, preparation, and evaluation.

6. A duplicate section, about the same size as the original, needs fully as much time for evaluation but only one-third as much time for preparation as the original. This means that a duplicate section of a typical four-hour course requires only three hours for these two factors as compared with five hours for the original.

7. The average number of student hours taught in the teachers college is 360 per week. Number of student hours is assumed to mean the sum total of the products obtained by multiplying the number of students in each class by the credit hours offered by the course. It is not necessarily the same as the number of student contact hours which is often used as a measure of service load.

8. It is assumed that variation in the number of students directly affects time required for evaluation and student conferences. For each student hour deviation from the norm of 360, two minutes per week should be added or subtracted. This rule is based on the assumption that eight hours--one-half the usual teaching load of sixteen credit hours--are normally spent in evaluation and that four hours are normally devoted to student conferences. Twelve hours divided by 360 yields an increment of two minutes per student hour per week.

9. The graduate class requires 1.4 times as much time as the undergraduate class for preparation and evaluation. In practice, a twelve-hour assignment of graduate courses is compared favorably with a fifteen-hour undergraduate assignment. Assumptions two, three, and four, would yield totals of 27.0 and 33.75 hours respectively for these two assignments. Six hours--one-half the graduate credit-hour assignment--would almost equate the two loads.

10. Any course taught for the first time by an instructor requires little or no more time for evaluation but twice as much time for preparation as it would require thereafter. This necessitates an additional three-fourths of an hour per week for each credit hour offered by the new course.

11. The average amount of time spent in carrying out non-instructional duties and responsibilities is 16 hours per week, distributed somewhat as follows: meetings, 1.5 hours; student conferences, 4 hours; extra-class activities, 2 hours; observation of student teachers from the instructor's own department, 0.5 hours; office routine, 3 hours; professional growth and contributions, 4 hours; and public relations, 1 hour.

It is assumed that the typical experienced teacher will devote 16 hours to these duties. The beginning teacher or one with no special or extra-curricular assignments will spend only 12 hours doing this type work. The department head, with approximately three-fourths teaching load, because of his many additional administrative, supervisory, and advisory duties, will devote about 25 hours per week to these tasks. Finally, the administrator or supervisor who teaches only half-time will spend 34 hours carrying out his non-instructional duties.

The last two figures were arrived at in the following manner:

Three-fourths of sixteen hours--the average teaching assignment--is twelve hours. Assumptions two, three, and four, would yield a total of twenty-seven hours needed for instructional duties. Fifty-two hours--the average total load--less twenty-seven gives the twenty-five hour figure for department heads and others who teach such a load. In like manner, one-half of sixteen hours is eight hours, which, with the above assumptions applied, yields a total instructional load of eighteen hours. So, for the half-time teacher, a total load of fifty-two hours less an instructional load of eighteen hours yields a non-instructional load of thirty-four hours.

12. It is assumed that the rank of the college teacher is merited by his experience and qualifications, which, it is further assumed, tend to increase his prestige and the demand for his services. Some authorities<sup>2</sup> suggest that this increased demand on the time of the instructor of higher rank is usually provided for by decreased teaching assignments. Present practice does not bear out this fact, and so it is assumed that an additional increment of at least one-half hour for each step in rank above the instructor is necessary in calculating the total load.

#### Statement and Interpretation of the Formula

In developing the following formula for measuring or estimating the service load of a faculty member in a teachers college, attempts have been made to satisfy all the basic assumptions just listed.

$$L = P + \frac{5C}{4} - \frac{D}{2} + \frac{S - 360}{30} + \frac{G}{2} + \frac{3N}{4} + R + K$$

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<sup>2</sup>Lindsay and Holland, p. 446.

The symbols in the formula are to be interpreted as follows:

- L - Total service load in hours per week
- P - Hours spent in presentation--number of periods per week actually spent in class
- C - Credit hours assigned--applicable to either quarter or semester hours, provides for time usually devoted to preparation and evaluation
- D - Credit hours in which duplicate sections are taught--this item provides for reduction in preparation time required for these duplicate sections
- S - Number of student hours--provides for variations in time needed for evaluation and for student conferences as class enrollment deviates from the norm
- G - Graduate credit hours assigned--provides for level of instruction differences
- N - Credit hours in which new classes are taught--provides for increase in preparation time required when teaching a course for the first time
- R - Rank coefficient--R is zero for the instructor, .5 hour for the assistant professor, 1 hour for the associate professor, and 1.5 hours for the full professor
- K - Non-instructional load coefficient--K is 12 for the typical beginning teacher, or for any other who has few or no special assignments; K is 16 for the typical full-time experienced teacher; K is 28 for the staff member with approximately three-fourths of a teaching load, 25 hours for the non-teaching duties and 3 extra to compensate for normal decrease in student hour load; K is 40 for the half-time teacher-administrator, 34 hours for non-teaching duties and 6 additional to compensate for normal loss in student hour load.

#### Examples of Application

To facilitate understanding, demonstrations of the application of this formula are hereby presented. Four examples should suffice.

Example 1. A beginning teacher with rank of instructor is assigned to teach fourteen semester hours in Business Education. His classes meet

fourteen periods per week; he has three sections of a three-hour course; and he teaches a total of 345 student hours per week. What is his total service load?

$$\begin{aligned}
 L &= P + \frac{5C}{4} - \frac{D}{2} + \frac{S - 360}{30} + \frac{G}{2} + \frac{3N}{4} + R + K \\
 &= (14) + 5/4(14) - 1/2(6) + \frac{345-360}{30} + (0) + 3/4(14) + (0) + (12) \\
 &= 50.5 \text{ hours per week.}
 \end{aligned}$$

Example 2. An experienced teacher with rank of associate has been assigned to teach six hours of Health Education and six hours of Physical Education. His classes meet a total of eighteen hours per week; he has six sections of a one-hour activity course; he is teaching a two-hour health course for the first time; and he teaches a total of 420 student hours per week. What is his load?

$$\begin{aligned}
 L &= P + \frac{5C}{4} - \frac{D}{2} + \frac{S - 360}{30} + \frac{G}{2} + \frac{3N}{4} + R + K \\
 &= (18) + 5/4(12) - 1/2(5) + \frac{420-360}{30} + (0) + 3/4(2) + (1) + (16) \\
 &= 51.0 \text{ hours per week.}
 \end{aligned}$$

Example 3. An experienced teacher with rank of assistant has been assigned fifteen hours in English. Her classes meet fifteen periods per week; she teaches two sections of a three-hour course, one new three-hour course on the graduate level, and a total of 430 student hours per week. What is her load?

$$\begin{aligned}
 L &= (15) + 5/4(15) - 1/2(3) + \frac{430-360}{30} + 1/2(3) + 3/4(3) + (.5) \\
 &\quad + (16) = 54.8 \text{ hours per week.}
 \end{aligned}$$

Example 4. A department head with rank of professor is assigned to teach ten credit hours in Chemistry; six hours of lecture and nine hours of laboratory. One two-hour graduate course is new to him. He teaches 200 student hours per week. What is his load?

$$\begin{aligned}
 L &= P + \frac{5C}{4} - \frac{D}{2} + \frac{S - 360}{30} + \frac{G}{2} + \frac{3N}{4} + R + K \\
 &= (15) + 5/4(10) - (0) + \frac{200-360}{30} + 1/2(2) + 3/4(2) + (1.5) + (28) \\
 &= 54.2 \text{ hours per week.}
 \end{aligned}$$

#### Summary

The preliminary study of faculty service load made at Northeastern State College in 1955-1956 revealed practices very similar to the findings typically reported in the literature.

Twelve basic assumptions, pertaining to the relative amounts of time devoted to the several factors which contribute significantly to faculty load, were formulated in accordance with principles and practices discovered by the investigator.

Based on these assumptions, a hypothetical formula for measuring faculty service load in the teachers college was evolved. It now becomes necessary to prove the acceptability of this formula.

## CHAPTER IV

### METHOD AND PROCEDURE

A brief description of the experiment designed to test the validity of the formula, procedures used in securing the necessary data, and an analysis of the subjects chosen to participate in the experiment are presented in this chapter.

#### Method

The method employed for checking the acceptability of the formula is essentially statistical in nature. It was decided that a formula index of the total weekly service load for the 1957 spring semester--or quarter--for each of a relatively large number of instructors should be determined by applying the instrument directly to objective data pertaining to all of the assignments given to each instructor during this teaching period. For comparison purposes--as a criterion index--, it was decided to use the average of two independent estimates of the total weekly load of each subject. To provide these estimates, the investigator chose the two persons who, in his opinion, should have had the greatest knowledge of the time actually spent on the job by each instructor, namely, the instructor himself and the dean of his college. For validity purposes, it was planned that the instructor should give separate estimates of the several components of his load, the sum of such estimates to be computed by the investigator. Because the dean would be expected to give estimates



on several instructors, such estimates to serve primarily as checks or balances for the instructors' estimates, it was thought wise to ask of the dean only a single estimate of total weekly load for each teacher.

The degree of agreement between the formula index and the criterion index so obtained forms the basis for drawing the inference of validity. The relationship is apparently linear and so the Pearson product-moment coefficient of correlation was deemed adequate to demonstrate the degree of agreement.

In an effort to further prove the acceptability of his formula, the investigator thought it necessary to show that there is no significant difference between the index of total load obtained by use of the instrument and that indicated by the criterion. Assuming, therefore, the null hypothesis, it was decided to determine the significance of the difference between correlated means and the significance of the difference between correlated standard deviations of the two sets of measures at the .10 level of probability.

### Subjects

Knowing that errors which arise from bias of any sort are neither detected nor measured by reliability formulas, it is agreed that only good data will enable the good statistical technique to yield valid results.<sup>1</sup> And so, in selecting the subjects to be used in this study, much effort was made to secure a truly representative sample. Proper distribution according to department, rank, tenure, and relative load, as well as the total size and geographical distribution of the sample, were considered.

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<sup>1</sup>H. E. Garrett, Statistics in Psychology and Education (New York, 1953), p. 209.

From the standpoint of size, the total population of deans of the colleges selected to participate in this study did not seem prohibitive, and so the help of each was solicited. The total population of instructors, on the other hand, was considered to be somewhat large and unwieldy and certainly not necessary, providing the good sample could be obtained. Consequently, the dean of each of the seventy-four selected institutions was asked to choose from his faculty only eight members, according to the following instructions: (1) Select no person who is not teaching at least half-time; (2) choose from all ranks, from instructor through professor; (3) choose from as many different departments as seems feasible; (4) select some with short tenure, some with long; and (5) select some whom you consider to be carrying an average load on your campus, some heavier than average, and some lighter than average.

#### Materials

Two forms were prepared for securing the necessary data, copies of which are to be found in the appendixes. The "Dean's Estimate of Faculty Load" provided space for; (1) the names of the eight faculty members to be chosen by the dean to participate in the study, (2) the department represented by each, (3) the number of teachers in that department, (4) the size of his faculty, and (5) a check-list for the dean to indicate his estimate of total weekly service load carried by each teacher named.

The second form, titled "Faculty Service Load Report," was designed to obtain information for two purposes. It was built to provide objectively determined data to be used in computing load by means of the formula, and also to provide information to be used in computing the teacher's estimate of total load.

The objective information requested on the second form included: (1) department name and number of each course taught, regardless of the number of duplicate sections; (2) semester--or quarter--hours credit offered by each course; (3) graduate and under-graduate enrollment in each class; (4) clock hours spent weekly in each class, according to the method of presentation used; (5) courses taught for the first time by the instructor; (6) tenure in his present position; and (7) his rank.

The instructor's statement of time actually spent in class, plus his estimate of time given to preparation and evaluation, plus the sum of his estimates of time devoted weekly to the many non-instructional duties and responsibilities listed in the report, enabled the investigator to compute each instructor's estimate of his total weekly load. For purposes of analyzing the sample, this second schedule also supplied information relative to the teacher's academic qualifications and teaching experience.

#### Analysis of the Sample

Table II presents a list of the participating colleges and the distribution of participating teachers according to departments. It will be noticed that fifty-one institutions from eighteen different states in the North Central area are represented in the sample.

Of the seventy-four deans whose cooperation was solicited, sixty-nine per cent provided the requested information. Ten others did not participate but returned letters of explanation. Only thirteen failed to respond.

Of the ten deans who gave reasons for not taking part in the study, one expressed willingness to do so but felt that his method of assigning

TABLE II

## COOPERATING INSTITUTIONS AND THEIR DEPARTMENTAL REPRESENTATION IN THE SAMPLE

Colleges Reporting			Number of Teachers Reporting by Departments														
State	City	College	Art	Biology	Business	Educ.-Psy.	English	Health	Home Ec.	Ind. Arts	Languages	Math.	Music	Phys. Sc.	Soc. Sc.	Speech	Total
Arizona	Flagstaff	Arizona State			1		2					1					6
	Tempe	Arizona State			1	3									1		5
Arkansas	Arkadelphia	Henderson State Teachers		1		2								1	1		5
	Conway	Arkansas State Teachers			1		1	1		1		1	1	1	1		8
Colorado	Jonesboro	Arkansas State			3	1	1	1				1	1				7
	Alamosa	Adams State				2	1	1		1	1			1	1		8
Illinois	Greeley	Colorado State	1		1	1	1	1					1	1	1		8
	Charleston	Eastern Illinois State		1	1	1	1	1		1			1		1		8
Iowa	Macomb	Western Illinois State			2		1	1		2					1		6
	Cedar Falls	Iowa State Teachers	1		1	1	1	1				1		1	1		8
Kansas	Emporia	Kansas State Teachers			1	2			1			1		1	1		7
	Pittsburg	Kansas State Teachers		1	1	1	1	1				1		1	1		8
Michigan	Kalamazoo	Western Michigan U.			1	1	2			1				1	2		8
	Marquette	Northern Michigan		1	1	1	1					1			2	1	8
	Mt. Pleasant	Central Michigan		1		1	2					1	1	1	1		8
Minnesota	Ypsilanti	Eastern Michigan	1			1	1				1	1		1	1	1	8
	Bemidji	State					1	1					1	2	1	1	7
	Mankato	Mankato State		1	1	1	1	1					1	1	1		8
	Moorhead	State	1			1		2		1				1	2		8
Missouri	St. Cloud	State			1	1	2			1					2	1	8
	Winona	Winona State	1	1			1	1		1			1		1	1	8
	Cape Girardeau	Southeast Missouri State	1					1			1	1		1	1	1	7
	Kirksville	Northeast Missouri State			1	1			1			1	1		1		6
Nebraska	St. Louis	Harris Teachers		1			1	1			1	1		1	2		8
	Chadron	Nebraska State Teachers				1	2	1		1		1		1	1		8

TABLE II (Continued)

Colleges Reporting			Number of Teachers Reporting by Departments															
State	City	College	Art	Biology	Business	Educ.-Psy.	English	Health	Home Ec.	Ind. Arts	Languages	Math.	Music	Phys. Sc.	Soc. Sc.	Speech	Total	
Nebraska	Peru	Nebraska State Teachers				1	1			1		1		1	1		6	
	Wayne	Nebraska State Teachers		1		2	1	1		1		1			1		8	
New Mexico	Las Vegas	New Mexico Highlands U.			2	1	1	1			1			1	1		8	
North Dakota	Dickinson	State Teachers	1		1	2		1				1	1		1		8	
	Mayville	State Teachers	1					1				1	1		1		5	
	Minot	State Teachers		1	1	2	1	1					1		1		8	
Ohio	Cleveland	St. John's	1	1		1	1	2					1				7	
Oklahoma	Ada	East Central State	1			1	1	1				1		1			6	
	Alva	Northwestern State			1	1	1			1			1	1	1	1	8	
	Durant	Southeastern State				1	2	1		1			1	1	1	1	8	
	Edmond	Central State			1	1	1					1	1	1	1	1	7	
	Tahlequah	Northeastern State			1	1	1					1	1	1	2		8	
	Weatherford	Southwestern State	1		1	1	1			1			1	1	1		8	
	South Dakota	Madison	General Beadle State				2	1					1	1		2		7
		Spearfish	Black Hills Teachers			1			1			1				1		4
Springfield		Southern State Teachers		1		2	1					1			2		7	
West Virginia	Athens	Concord	1	1	1	1		1				1		1	1		8	
	Bluefield	Bluefield State		1	1	1	1			1					1		6	
	Fairmont	Fairmont State	1	1	2	1										1	6	
	West Liberty	West Liberty State			1				1			1	1		2		6	
Wisconsin	Eau Claire	Wisconsin State		1		1	1	1			1	1	1		1		8	
	Menomonie	Stout State	1						2	3				1	1		8	
	Oshkosh	Wisconsin State	1	1		1	1				1	1	1	1	1		8	
	River Falls	Wisconsin State		1		1	2			1			1	1	1		8	
	Stevens Point	Wisconsin State	1	2			1		1					1	2		8	
	Whitewater	Wisconsin State		1	2	1	1					1			1		7	
Totals		Fifty-one Colleges	16	21	34	49	44	27	6	20	8	27	22	30	57	9	370	

load would distort the findings. Another had moved to a new college and was no longer in the position of dean. Three hesitated to "burden the teachers with completing questionnaires at this busy time of the year." Two others pointed out that they had committed themselves to a similar study for the following year and felt that to participate in this one would be a duplication of effort. One dean confessed that he had mislaid the forms but expressed willingness, at a rather late date, to complete another set. Still another indicated much interest in the study and stated that his teachers were in the process of completing the questionnaires; but, for some reason, they never arrived. The tenth dean provided a brief description of his method of assigning load in lieu of the information requested.

The thirteen deans who failed to respond were quite widely scattered, geographically speaking, and in every instance at least one other school in the same state professed interest and willingness to participate. It is thought, therefore, that the non-response of these thirteen contacts presents no probability of bias with respect to prevailing policy or practice pertaining to assignment of faculty load. Much interest evidenced by the many supplementary letters and notes from the deans who did respond was very encouraging to the writer. Excerpts from some of these may be found in Appendix C.

Of the 592 instructors whose help was originally anticipated, 370 completed and returned questionnaires. Of these, fourteen were not used for one reason or another. Five of the teachers were found to have been teaching less than half-time, two failed to follow instructions well enough for their reports to be interpreted properly, and the remaining seven failed to send their reports in time for them to be included in the

tabulation. However, these late reports were quite typical of the ones tabulated, and it is very doubtful if their inclusion would have significantly altered the results.

Table III presents a distribution of the subjects according to the relative load carried by each as indicated by the deans.

TABLE III  
DISTRIBUTION OF SUBJECTS IN THE SAMPLE ACCORDING  
TO THE DEANS' ESTIMATES OF WEEKLY LOAD

Hours Per Week	Frequency
54 - Above . . . . .	40
50 - 53 . . . . .	44
46 - 49 . . . . .	50
42 - 45 . . . . .	87
38 - 41 . . . . .	60
34 - 37 . . . . .	39
0 - 33 . . . . .	36

It is quite obvious that most deans arbitrarily selected forty-two to forty-five hours as the average weekly load on their campuses. It will be noticed that the number selected from below this category is almost identical to the number selected from above this category. Some deans refused to differentiate, however, and placed all eight of their choices in the same bracket. Other deans used no more than two or three classes, yet Table III reveals a range of at least twenty-four hours in the total distribution. This would indicate much variability in relative load among the instructors represented in the sample.

Table IV presents a percentage-wise comparison of the distribution by departments of the subjects composing the sample and the corresponding distribution in the selected population. This latter distribution was compiled from exhibits by the participating colleges as reported recently

by the American Council on Education.

TABLE IV

DEPARTMENTAL DISTRIBUTION OF SUBJECTS IN THE SAMPLE AS COMPARED WITH  
A CORRESPONDING DISTRIBUTION IN THE POPULATION

Department	Number in the Sample	Percentage of the Total Sample	Number* in the Population Represented	Percentage of the Population Represented
Art . . . . .	14	3.9%	176	4.3%
Biology . . . . .	19	5.3%	241	5.8%
Business . . . . .	32	9.0%	297	7.2%
Education & Psychology	49	13.8%	680	16.4%
English . . . . .	44	12.4%	455	11.0%
Health & Phys. Educ. .	25	7.0%	372	9.0%
Home Economics . . .	6	1.7%	110	2.7%
Industrial Arts . . .	20	5.6%	227	5.5%
Languages . . . . .	8	2.2%	128	3.1%
Mathematics . . . . .	26	7.3%	225	5.5%
Music . . . . .	22	6.2%	282	6.9%
Physical Science . . .	28	7.9%	293	7.1%
Social Science . . . .	54	15.1%	561	13.6%
Speech . . . . .	9	2.5%	72	1.8%
Total	356	99.9%	4119	99.9%

\*Source: American Council on Education, American Universities and Colleges, ed. Mary Irwin (Washington, D. C., 1956).

Although it is admitted that the status of each department, with respect to number of teachers, could have changed considerably within the interval between the date of publication of our source of information and the date on which the sample was taken, it is considered to be highly improbable. This criterion provided by the American Council on Education is, therefore, assumed to be quite valid and reliable.



Assuming the null hypothesis, the Chi-square test was used to compare the observed frequencies in each department with the expected frequencies as computed from the information given in Table IV. The probability of exceeding the computed Chi-square is approximately .45,<sup>2</sup> which indicates that the divergence between observed and expected frequencies is certainly no greater than that which can be attributed solely to sampling fluctuations. It is concluded, therefore, that the null hypothesis is true and that the sample is not biased as regards departmental representation.

The exhibits listed in the 1956 edition of "American Universities and Colleges" were also used to compile expected frequencies with regard to degree qualifications and rank. Tables V and VI present the distribution of subjects in the sample with reference to these items as compared with the corresponding distributions in the selected population.

TABLE V

DEGREE QUALIFICATION DISTRIBUTION OF SUBJECTS IN THE SAMPLE AS COMPARED WITH A CORRESPONDING DISTRIBUTION IN THE POPULATION

Qualification	Number in the Sample	Percentage of the Total Sample	Number* in the Population Represented	Percentage of the Population Represented
Bachelor's Degree	10	2.8%	148	3.6%
Master's Degree	196	55.1%	2353	57.1%
Doctor's Degree	150	42.1%	1618	39.3%

\*Source: American Council on Education, American Universities and Colleges, ed. Mary Irwin (Washington, D. C., 1956).

Again the null hypothesis and the Chi-square test were employed to

<sup>2</sup>Garrett, p. 428.

check the divergence between observed and expected frequencies as regards both degrees earned by instructors and their rank. The probabilities of exceeding the computed Chi-squares were found to be .43 and .09 respectively, and in each case one must conclude that the divergence is no greater than that which can be explained by sampling fluctuations. The null hypothesis is again accepted. Consequently, the sample must also be considered adequate with reference to the training and prestige of the instructors who compose it.

TABLE VI

DISTRIBUTION OF SUBJECTS IN THE SAMPLE ACCORDING TO RANK AS COMPARED WITH A CORRESPONDING DISTRIBUTION IN THE POPULATION

Rank	Number in the Sample	Percentage of the Total Sample	Number* in the Population Represented	Percentage of the Population Represented
Instructor	60	16.9%	602	14.6%
Assistant	92	25.8%	1261	30.6%
Associate	108	30.3%	1105	26.8%
Professor	82	23.0%	904	22.0%
No Rank	14	3.9%	247	6.0%

\*Source: American Council on Education, American Universities and Colleges, ed. Mary Irwin (Washington, D. C., 1956).

Table VII presents an analysis of the sample with regard to tenure and teaching experience. Over eighty per cent of the subjects have taught a minimum of three years at the college level. Nearly fourteen per cent have been teaching more than twenty years at this level, while some twenty per cent may be classed as beginning or probationary college teachers. Only forty-seven of the 356 subjects were teaching in positions new to them in 1957. This indicates a probable turnover of only

thirteen per cent. In addition to eleven years of college experience, the average subject in the sample was found to have taught nearly six years in the public schools.

TABLE VII  
DISTRIBUTION OF INSTRUCTORS COMPOSING THE SAMPLE WITH REFERENCE  
TO TEACHING EXPERIENCE

Experience	Number in the Sample	Per Cent of the Total Sample
Three years or less at the college level	68	19.1%
More than three years but less than twenty	240	67.4%
More than twenty years at the college level	48	13.5%
New to their positions at time of the study	47	13.2%

Since all categories of teachers with regard to experience are well represented, including some with little or no experience, some with much experience, and many with a moderate amount of experience, it is assumed that the sample is not biased with reference to this item.

#### Summary

In this chapter the writer has attempted to describe briefly the experiment designed to compare statistically the index of total weekly service load of the instructor in the teacher education institution, as computed by his formula, with a logically chosen criterion index.

Procedures for selecting the subjects to participate in the experiment and for securing the necessary data were also presented. Stratified sampling techniques and the questionnaire were employed. Much effort was made to obtain a random and, at the same time, a truly representative

sample.

Finally, the sample obtained was described, and analyzed for possible bias with regard to size, geographical distribution, departmental spread, academic background, rank, teaching experience, and relative load. It was considered quite adequate with respect to each of these factors. Spurious correlation results due to bias in the sample are, therefore, not anticipated.

## CHAPTER V

### ANALYSIS OF THE DATA

Confident that the reader will agree that the formula developed in this study adequately considers all pertinent factors which contribute appreciably to faculty service load in the teachers college, and satisfied that the sample obtained for experimentally testing it is not biased with respect to size, geographical distribution, or to representativeness regarding department, rank, academic training, and relative load, the writer now wishes to present a statistical treatment of the data in an effort to establish the validity and reliability of this instrument. Such is the purpose of this chapter.

Specifically, it is desired here to answer the following questions:

1. To what degree does the formula measure what it purports to measure? In other words, is it valid?
2. Is the formula a dependable instrument for measuring faculty service load in the teachers college? Does it give consistent measurements?
3. Does the index of load as calculated by the formula differ significantly from that indicated by the criterion?
4. Is the formula better suited to measure service load in some departments than in others? If so, which?

#### The Inference of Validity

Does the formula truly measure faculty service load in the teachers

college? To answer this question, it was decided that it would be wise to determine the degree of correspondence or relationship between a set of scores obtained by means of the formula and a corresponding set of criterion scores for a sample group of teachers college instructors. Because this relationship is apparently linear, the Pearson product-moment coefficient of correlation was chosen to show the degree of correspondence.

TABLE VIII

## INTER-CORRELATIONS AMONG FOUR METHODS OF DETERMINING FACULTY LOAD

Method	Dean's Est.	Teacher's Est.	Criterion	Formula
Dean's Estimate	---	.15	.60	.40
Teacher's Estimate	.15	---	.88	.76
Average (Criterion)	.60	.88	---	.81
Formula Index	.40	.76	.81	---

Table VIII presents the inter-correlations among the four sets of scores provided by the four techniques employed in calculating the load of each subject in the sample. It will be noted that the criterion and teacher's estimate scores are most closely related--coefficient of correlation is .88-- , but the feasibility of using the teacher's estimate semester after semester, for determining faculty load is indeed doubtful. It is not sufficiently objective to prevent certain individuals, who may wish to do so, from taking advantage of the method for personal gain. Also, the teacher's estimate technique would have little predictive value, because the data could not be available until the teaching period was well under way.

The dean's estimate of faculty load correlates substantially with the criterion-- .60 --, but it, too, is usually determined quite subjectively. As indicated in the table, the dean's estimate and that of

the teacher were found to be relatively independent of each other, yet both show marked correlation with the criterion and with the formula measures.

Of greatest significance to this study is the coefficient of correlation between formula and criterion scores of faculty load. This is relatively high<sup>1</sup> -- .813 --, and the standard error is small, as will be shown. By converting the Pearson  $r$  into Fisher's  $z$ -function<sup>2</sup> and computing the standard error in terms of the number in the sample, and then by re-converting to  $r$ -values, the .95 confidence interval is found to be between .78 and .84. This means that only one time in twenty should it be expected that the  $r$  of any other sample taken from the same population would lie beyond the limits of this interval. Also, assuming the null hypothesis, it becomes quite evident that this  $r$  of .813 is very significant, even at the .01 level. Under the given conditions, the critical ratio at the .01 level is only .148.<sup>3</sup> This means that if the null hypothesis were true and the formula scores were entirely independent of the criterion scores, only one time in one hundred would sampling fluctuations alone produce an  $r$  as great as .148.

The evidence infers that there is a high degree of correspondence between formula scores and criterion scores and, therefore, that the formula is a valid instrument for measuring faculty service load in the teachers college.

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<sup>1</sup>Garrett, p. 173.

<sup>2</sup>Ibid., p. 198.

<sup>3</sup>Ibid., p. 200.

### Reliability of the Formula and of the Criterion

Realizing that a high correlation between a measuring instrument and a criterion is evidence of validity only if the instrument and the criterion are both reliable, the writer submits the following arguments in an effort to show reliability in his formula and in the selected criterion.

In using the formula, with one possible exception, it is applied to specific data pertaining to each component contributing to the total load score. This exception is  $K$ , the non-instructional load coefficient. But even here, there is much objectivity, because the person using the formula has but four choices, each of which is well defined.

Although reliability seems to be inherent in the formula, due to the objectivity of its application, it was decided to check the reliability statistically. The instrument was applied a second time--four months after the first--to information supplied by fifty of the 356 subjects. These results were correlated with the scores first obtained and the coefficient of reliability was found to be .97. As will be shown later in this chapter, the standard deviation of the formula scores is only 6.61 hours. The standard error of a score obtained by means of the formula is, therefore, only slightly more than one hour. This means that two-thirds of the obtained scores probably lie within one hour of the true formula score. Even at the .95 level of confidence, an obtained score must differ no more than 2.16 hours from the true formula score. It is contended, therefore, that the formula is relatively free of chance errors of measurement and that the scores obtained by it are stable and trustworthy.



The reliability of the criterion, admittedly, is questionable, not because of the source selected for providing the data, but because of the subjectivity involved in making estimates. In this case, however, much of the information upon which the estimate was based was entirely objective in nature. Also, the questionnaire devised for collecting these data required several separate estimates of components of the total load, rather than a single estimate. This procedure should have facilitated more careful deliberation on the part of each subject who provided an estimate of his service load, thereby increasing the reliability of this information.

Further, the criterion is an average of two entirely independent estimates, and it is apparent in this study that the one has a very definite balancing effect upon the other.

Finally, as will be shown later, the mean of the criterion scores--50.88 hours per week--compares very favorably with the average load in teachers colleges as discovered and revealed by other investigators.<sup>4</sup>

In view of the fact that college teachers have never been required to provide a day-to-day record of time devoted to their jobs, it is very doubtful if a more reliable criterion could have been found than the one selected for this study.

#### A Comparison of the Formula Scores With the Criterion Scores

To further prove the acceptability of the formula developed in this study, it was decided to determine whether or not there is a real difference between scores obtained by it and those indicated by the criterion.

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<sup>4</sup>Young, p. 46.

The purpose of this comparison is to determine whether or not the formula may be used, not only as a predictive device for evaluating load, but also as a direct instrument of measurement, the results of which would be simple, comparable, combinable, and comprehensible.

Since the average load is considered to be the fair load in distributing faculty assignments and responsibilities, the arithmetic mean was chosen as the logical measure to be used in comparing formula and criterion scores. In developing the formula, this average was assumed to be fifty-two hours per week.

TABLE IX

## AN ANALYSIS OF MEAN FACULTY LOAD AS DETERMINED BY FOUR DIFFERENT METHODS

Method	Mean Load in Hours per Week	Standard Error of the Mean	Standard Error of Difference	Critical Ratio
Dean's Estimate	44.06	.36	.32	21.3
Teacher's Estimate	57.70	.57	.31	22.0
Average Estimate	50.88	.36	(Criterion)	----
Formula Index	50.80	.34	.22	00.4

Table IX presents an analysis of the mean faculty load in the teachers college as determined by the dean's estimate, the teacher's estimate, the criterion, and the formula. It will be noted that the means of the formula and criterion scores for the sample are only slightly less than the assumed mean for the population, and that these two measures differ by only .08 hour, as compared with a difference of over thirteen hours between dean's estimate and teacher's estimate mean scores.

The standard error of the mean provides an estimate of reliability in terms of probable divergence of each mean from the true mean of its particular distribution. This error in each case, as shown in the table,

is negligible--being less than one per cent of the total mean load--.

Assuming that all the means are stable and trustworthy, therefore, what about their differences? Are they significant?

To determine the reliability of the difference between the means of any two sets of scores, it becomes necessary to set up the null hypothesis and the desired level of significance, calculate the standard error of the difference in the means, and establish the critical ratio. This critical ratio is then used to guide the investigator toward acceptance or rejection of the null hypothesis and the obvious conclusion.

In an effort to avoid Type III errors--accepting the null hypothesis when a real difference exists--, the .10 level of significance was selected and the critical ratio for formula versus criterion means was found to be approximately 0.4. For 355--which is  $N-1$ --degrees of freedom, Garrett's table for determining the significance of statistics shows the critical ratio at the .10 level to be 1.65.<sup>5</sup> This means that as often as one time in ten a critical ratio equal to or greater than 1.65, due to sampling fluctuations alone, is to be expected. The ratio of 0.4 is much less, and hence must be of no significance whatever. The null hypothesis is accepted, therefore, and it follows that no real difference exists between the formula mean score and the criterion mean score of the population involved.

On the other hand, the difference between the mean of the deans' estimates and the mean of the criterion scores as well as the difference between the teachers' estimates and the criterion scores is quite large and quite significant, even at the .01 level. The critical ratios are

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<sup>5</sup>Garrett, p. 427.

far greater than the critical ratio of 2.59 for 355 degrees of freedom at the .01 level of significance. Consequently, it is logical to reject the null hypothesis regarding the difference in the means of criterion scores and deans' estimates as well as the difference in the means of criterion scores and teachers' estimates.

To complete the proof that no difference exists between formula scores and criterion scores, it becomes necessary to show, not only that their means do not differ, but also that there is no difference in the variability of the two sets of scores. The standard deviation has been chosen as the logical measure to show this variability.

TABLE X

AN ANALYSIS OF VARIABILITY IN FACULTY LOAD AS DETERMINED BY FOUR DIFFERENT TECHNIQUES

Technique	Standard Deviation Hrs./Week	Standard Error of Standard Deviation	Standard Error of the Difference	The Critical Ratio
Dean's Estimate	6.73	.26	.34	0.21
Teacher's Estimate	10.92	.40	.40	10.30
Average Estimate	6.80	.26	(Criterion)	-----
Formula Index	6.61	.24	.16	1.19

Table X presents an analysis of the variability in faculty load as measured by the four techniques used in this study. As indicated in this table, the standard deviations of scores obtained by use of the dean's estimate, the criterion, and the formula compare very favorably--all are close to 6.7 hours-- , while the standard deviation for teacher's estimate scores is much larger. The standard errors of all the measures, as for the means, are again quite negligible, ranging from about fifteen minutes for the formula measure to about twenty-five minutes for the teacher's

estimate error.

Assuming the null hypothesis and calculating the standard error of the difference between standard deviations for the criterion as compared with each of the other techniques, the critical ratio for each of these three methods was established. The critical ratio of 1.19 for the formula is considerably less than the 1.65 found in the table for determining the reliability of statistics under the given conditions. Hence, the difference is of no significance. The null hypothesis is accepted, and it is inferred that no real difference exists between the standard deviations of formula and criterion scores.

Upon studying Table X further, the reader should also conclude that there is no difference in variability between criterion scores and the deans' estimates, but that the difference in variability between the criterion scores and teachers' estimates is very large and, therefore, quite significant.

#### The Regression Equation

For predictive purposes, the coefficient of validity between formula and criterion scores, their means, and their standard deviations lead to the following regression equation:

$$\bar{C} - 50.88 = .84 (F - 50.80)$$

where  $\bar{C}$  is the criterion score predicted by any given formula score  $F$ . For example, a formula score of 51 hours predicts a criterion score of 51.05 hours, or a formula score of 44 hours predicts a criterion score of 45.17 hours.

Two-thirds of all scores obtained by the formula will differ no more

than one hour from the predicted criterion values. The probability is only one in twenty that the formula index of faculty service load will differ by more than two hours from the predicted criterion index. Hence, it is concluded that the formula index may be used as the true index of faculty load.

#### Departmental Analysis of Load

Table XI presents an analysis, by departments, of the data pertaining to formula versus criterion scores. This information is presented in an effort to show the relative suitability of the formula to evaluate faculty load in each of the several departments of study.

TABLE XI

#### A DEPARTMENTAL ANALYSIS OF FORMULA VERSUS CRITERION SCORES

Department	Number in the Sample	Mean of the Criterion Scores	Mean of the Formula Scores	The Coefficient of Validity
Art . . . . .	13	47.5	46.8	.753
Biology . . . . .	22	52.8	54.9	.796
Business . . . . .	33	50.3	50.7	.844
Education and Psychology . . . . .	47	51.2	51.9	.790
English . . . . .	44	51.5	50.3	.694
Health and Physical Education	22	47.5	46.6	.920
Home Economics . . . . .	6	46.2	44.0	.456
Industrial Arts . . . . .	19	51.4	51.9	.886
Languages . . . . .	8	47.4	46.0	.816
Mathematics . . . . .	26	52.3	53.0	.793
Music . . . . .	22	47.1	46.6	.818
Physical Science . . . . .	29	50.8	51.9	.778
Social Science . . . . .	57	53.4	53.1	.834
Speech . . . . .	8	53.2	52.1	.811
Total . . . . .	356	50.9	50.8	.813

With one rather noticeable exception, the coefficient of validity for each department is high and the difference in the means is small. The relatively low correlation for Home Economics might be explained by the fact that the size of the sample for this department, although fairly representative, is extremely small, thus leading to possible spurious conclusions when used exclusively.

In general, one might conclude from a study of this table that the formula is almost equally suitable for use in all departments, but seems to be a little more valid for the Business, Health, Industrial Arts, and Social Science groups, and perhaps a little less valid for the Art, Home Economics, and English groups. Incidentally, the table reveals variations in faculty load between departments. It appears that teachers of Art, Health, Home Economics, Languages, and Music carry relatively light loads, while instructors in Biology, Mathematics, Social Science, and Speech carry relatively heavy loads. In most instances, however, the departmental sample is too small to draw valid inferences.

It would also be interesting to know the relative cost of instruction in the several departments, but such is not the purpose of this study.

### Results

A statistical treatment of the data has revealed the following information:

1. The service load normally carried by the faculty member in the teachers college of the North Central Association is approximately fifty-one hours per week. This load as indicated by the formula developed in this study differs by only .08 hours from that indicated by the selected criterion. The means are both highly reliable, the standard error, in

each case, being only about one-third of an hour.

2. The null hypothesis at the .10 level of significance was arbitrarily set as the criterion for analyzing the difference in the means of the formula and the criterion scores. It was readily accepted.

3. The same procedure was used to establish the significance of the difference in standard deviations of the two sets of scores, and again the null hypothesis at the .10 level was accepted.

4. The coefficient of reliability of the formula was found to be very high-- .97 --, and the instrument is, therefore, considered to be entirely dependable and trustworthy.

5. The reliability of the criterion, on the other hand, could not be proved statistically. It was accepted on the assumption that the source, the procedure for obtaining it, and the mean value obtained, are all logical and dependable.

6. The coefficient of correlation between the formula and the criterion measures was found to be .813, which is considered to denote a very high linear relationship.

7. The regression equation established for predicting a criterion score from any obtained score yields results which, for all practical purposes, are equal to the formula scores. The proof of the validity of the instrument is, therefore, deemed to be complete.

8. It was found, with one possible exception, that the formula is about equally suited for evaluating load in all of the several departments of the teachers college. This one exception in Home Economics. But, the size of the sample for this department was extremely low, which may explain the relatively low correlation.



## CHAPTER VI

### SUMMARY AND CONCLUSION

Believing that guesswork in the matter of faculty assignments can only lead to misunderstanding, ill feeling, waste, and inefficiency, the writer set out, in this study, to provide an objective technique for accurately measuring the service load of the faculty member in a teacher education institution.

A review of the literature revealed that, traditionally, much use of the credit hour, the teaching hour, and/or the student hour has been made in defining and assigning faculty load, but that these units are no longer acceptable to either teacher or administrator. They do not consider many factors which are thought to be pertinent in determining the service load of the college instructor. Following the recommendations of other investigators, the writer selected the clock-hour-per-week as the unit for measuring load in this study, because it appeared to be simple, comparable, combinable, and intelligible to the public. Hence, the service load was defined as the total number of clock hours per week which the faculty member devoted to his job.

The elements most often mentioned in the literature as deserving consideration in calculating service load were found to be: time spent in (1) presentation, (2) preparation, (3) evaluation, (4) conferences, (5) office routine, (6) meetings, (7) research, (8) professional reading, and (9) public relations; plus such factors as (1) number of students,

- (2) new courses, (3) duplicate sections, (4) method of presentation, (5) level of instruction, and (6) rank.

In accordance with principles and facts revealed by a survey of the literature and a preliminary study made at Northeastern State College, Tahlequah, Oklahoma, a formula for evaluating the service load, as defined, was developed. This formula is:

$$L = P + \frac{5C}{4} - \frac{D}{2} + \frac{S - 360}{30} + \frac{G}{2} + \frac{3N}{4} + R + K$$

where L - total load in hours per week,  
 P - hours per week spent in presentation,  
 C - credit hours assigned,  
 D - credit hours in which duplicate sections are taught,  
 S - student hours per week,  
 G - graduate credit hours taught,  
 N - credit hours offered by courses taught for the first time,  
 R - rank coefficient; 0 for instructor, .5 hour for assistant professor, 1 hour for associate, and 1.5 hours for the full professor,  
 K - non-instructional load coefficient; 12 hours for the beginning teacher, 16 hours for the typical experienced teacher, 28 hours for the instructor who devoted three-fourths of his time to teaching duties, and 40 hours for the half-time teacher.

The sixteen hours for the typical experienced teacher are assumed to be distributed as follows: meetings, 1.5 hours; student conferences, 4 hours; extra-class activities, 2 hours; observation of student teachers from the instructor's department, .5 hour; office routine, 3 hours; professional growth and contributions, 4 hours; and public relations, 1 hour.

To determine the acceptability of the formula, a criterion was chosen and an experiment designed. The criterion consisted of the average of two independent estimates of the total weekly load of the college instructor, one made by the instructor himself, and the other by the dean of his college.

The faculties from fifty-one out of a total of seventy-four selected teacher training institutions in the North Central area chose to participate in the study. The fifty-one deans and 356 instructors supplied information, by means of questionnaires, from which both the criterion and formula scores could be calculated. The sample was tested for bias with respect to size and to distribution according to departments represented, academic training, teaching experience, and relative load.

Finally, the data were treated statistically with the following results:

1. The average load in the teachers college was found to be approximately fifty-one hours per week.
2. This average load as measured by the formula was only .08 hours less than that indicated by the criterion. This difference is not significant; in fact, it is highly insignificant, even at the .10 level, which was the lowest criterion available.
3. The standard deviation of load scores, according to the criterion, is 6.80 hours. The standard deviation of formula scores was found to be 6.61 hours; and again, the difference was proved to be of no significance at the .10 level.
4. The formula was found to be very stable and trustworthy, its coefficient of reliability being .97. The reliability of the criterion was accepted on the assumption that the source, the procedure for obtaining it, and the mean value obtained, were all logical and dependable.
5. The coefficient of correlation between formula and criterion scores was found to be .813. This implies a high positive relationship, leading to the inference of validity. The corresponding regression equation yields predicted scores which are almost identical with the formula

scores.

6. With one exception, the formula appears to be about equally suitable for measuring load in all of the several departments to be found in the teachers college. The exception is Home Economics.

#### Conclusion

The evidence presented leads to the following conclusion. The formula developed in this study is a satisfactory technique for accurately and consistently evaluating faculty service load in the teachers college, because:

1. It is objective in its application. All information used in obtaining an index of load by use of this formula is a matter of record in the dean's office.

2. It should satisfy the instructor. According to principles and facts revealed by the literature and by a preliminary survey, the formula adequately considers all commensurable factors which are likely to contribute to service load in the teachers college.

3. It should satisfy the dean. The instrument reduces faculty load to a common unit which is simple, comparable, combinable, and intelligible to the public.

4. It is statistically sound. Its coefficient of validity is high, implying accuracy. Its coefficient of reliability is extremely high, implying consistency and dependability.

### Implications

Admittedly, the evaluation of loads by use of this formula will involve a considerable time on the part of subordinate members of the dean's staff, but the net result to the dean in effectively balancing faculty assignments will be not only an economy of time but a more harmonious and productive teaching staff.

By means of this formula, departmental and institutional summaries can easily be made, showing average, median, or total services rendered. These are necessary to reveal existing tendencies, such as:

1. What is a fair teaching load in a particular department? in the institution as a whole?
2. How do loads in different departments compare?
3. What are the salary costs of various faculty services?
4. Is it advisable to undertake a special program of expanded service at this particular time?
5. Who can be called upon for special duties this semester?
6. What is the lot of the beginning teacher in this school?
7. What additional teaching assignments can be made if time for research or for conferences with students is sacrificed during an emergency caused by unanticipated heavy enrollment?

Information leading to the solution of such problems is important not only to teachers and administrators, but also to regents, legislators, and other patrons of the teachers college. It should help to give these people a more sympathetic understanding of work done by the instructor.

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## APPENDIX A. COPY OF QUESTIONNAIRE SENT TO PARTICIPATING DEANS

THE DEAN'S ESTIMATE OF FACULTY LOAD  
(Per Week)

Name of Faculty Member	Department	Number Who Teach in Department	Please Check Your Estimate of His Total Service Load						
			Less Than 34 Hrs.	34-37	38-41	42-45	46-49	50-53	54-57
1.									
2.									
3.									
4.									
5.									
6.									
7.									
8.									

Please indicate the size of your faculty. \_\_\_\_\_

Dean's Signature \_\_\_\_\_

College Represented \_\_\_\_\_

Address \_\_\_\_\_

Do you wish a report of the findings of this study? \_\_\_\_\_

## APPENDIX B. COPY OF QUESTIONNAIRE SENT TO PARTICIPATING INSTRUCTORS

## FACULTY SERVICE LOAD REPORT

The following questionnaire has been designed to obtain information relative to a study of service load in teacher education institutions. You have been specifically chosen to participate in this study, the purpose of which is to develop a technique which may make possible a more equitable distribution of faculty assignments. Assuring you that all information will be treated confidentially, we earnestly solicit your cooperation. Please return this report to your dean upon completion.

Name \_\_\_\_\_ Rank \_\_\_\_\_

College Degrees \_\_\_\_\_ Teaching Experience: In Public Schools \_\_\_\_\_;

In College \_\_\_\_\_; In Present Position \_\_\_\_\_. (Include this term.)

IMPORTANT DIRECTION: In completing the remainder of this schedule, please reckon time in units of hours per week or fractions thereof. Be accurate.

I. TEACHING LOAD. Please list the courses which were assigned to you for the second semester of the 1956-1957 school year; also the enrollment in each class (whether graduate or undergraduate), the time spent in preparation and evaluation, and the time spent in presenting the subject (whether in regular, laboratory, or activity class). List each section, regardless of duplication of course name and number.

Dept. Name and No. of Course	Sem.Hrs. Credit	Enrollment		Clock Hrs. Classwork			Additional Time	
		Und.Gr.	Grad.	Reg.	Lab.	Act.	Prep.	Eval.
Term Total								

List the courses named above which were taught by you for the first time this term. \_\_\_\_\_

\*The ordinary class period, even though actually only fifty to fifty-five minutes in length, is to be counted as one full clock hour of time.

II. ~~NON-TEACHING LOAD.~~ Please estimate carefully the average number of hours spent each week in performing the following services.

Type of Service	Hours Per Week
Attendance at Meetings:	
Committee	
Departmental	
Faculty	
Other	
Conferences with Students:	
To Help with Classwork	
For Guidance Purposes	
Other	
Sponsorship of Extra-Class Activities:	
Fraternity or Sorority	
Interest Club	
Other	
Office Work:	
Official Correspondence	
Administrative Reports	
Other	
Public Relations:	
Representing College at Public Functions	
Judging Music, Speech, and Other Contests	
Commencement Speaking, Etc.	
Other	
Supervisory Duties:	
Visitations within Department	
Observation of Departmental Student Teachers	
As Critic Teacher or Coordinator	
Research:	
Professional Reading (Other than Class Prep.)	
Professional Writing, Painting, Composing, Etc.	
Other Assigned Duties:	
Total (Non-teaching Load)	

## APPENDIX C. EXPRESSIONS OF INTEREST IN AND NEED FOR THIS STUDY

With only one or two exceptions, all participating deans expressed a desire to have a report of the findings of this study. In addition, several emphasized their interest in and need for a solution to the problem by writing supplementary cards or letters. The following are excerpts from a few of their statements.

We are glad to be able to participate in this valuable survey and are anxious to see the results in summary form.

Thank you for your consideration. We would appreciate the results of your study.

I am very anxious to get a report on this study you are making. In my opinion, it is very worthwhile. I know that, personally, I have been looking for and studying different methods of determining faculty load for quite awhile.

Actually the teaching load has become so burdensome of late, since the imposition of the 15-hour minimum, that few instructors have much time for anything but teaching.

We have tried to arrive at some equitable means of dividing loads. We have not found one which is completely satisfactory. Am quite interested in the results of your study.

The following excerpt tends to validate the belief that an objective technique for measuring faculty service load is needed.

I know that the faculty people who have reported extremely heavy service loads are very busy and very conscientious people. I do think, however, that they utilize more time in eating, sleeping, and recreating themselves than the difference between their service loads and the total hours available in a week would appear to indicate.

I trust I have not been too conservative in my estimates. I presume you will find that this is a universal complaint in this type of study.

VITA

Vernon Wilson Burrows

Candidate for the Degree of

Doctor of Education

**Thesis:** EVALUATION OF FACULTY SERVICE LOAD IN THE TEACHERS COLLEGE

**Major Field:** Higher Education

**Biographical:**

**Personal data:** Born in Claremore, Oklahoma, October 30, 1909, the son of Charles Claude and Laura Belle Burrows.

**Education:** Attended grade school and junior high school in Stonewall, Oklahoma; graduated from Horace Mann High School, Ada, Oklahoma, in 1926; received the Bachelor of Science degree with a major in Mathematics from East Central State College at Ada in 1929; did post-graduate work in Physics and Mathematics at the University of Oklahoma in 1935; received the Master of Science degree with a major in Education Administration from the Oklahoma State University in 1942; did graduate work in Mathematics at the University of Arkansas in 1951; completed requirements for the Doctor of Education degree in May, 1958.

**Professional experience:** Taught science and mathematics ten years, served as junior high school principal three years, and as high school principal four years in the public schools of Purnell, Weleetka, Beggs, Stigler, and El Reno, Oklahoma; served as an instructor in navigation at Mustang Field for twenty-two months and as an instructor in the C-1 Autopilot at the Oklahoma City Air Depot for eight months during World War II; taught mathematics six years and served as a coordinator of student teaching five years at Northeastern State College, Tahlequah, Oklahoma.

**Professional organizations:** National Education Association, Oklahoma Education Association, The Association for Student Teaching, The National Council of Teachers of Mathematics, and Kappa Mu Epsilon Mathematics Fraternity.