

PubH 6561
Quant Methods Applied to HC Problems
Spring Semester
T and Th 1:25-3:20 D199 Mayo
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I. Intent

Have students demonstrate, as part of a "research or quantitative consultation" team, that s/he can apply quantitative methods to health care administrative processes.

Expectation: to link previous and new quantitative methods to a specific data based project.

General course objectives:

- a. Identifies and defines measures that are project specific
- b. Recommendations must show how actions can be taken
- c. Recommendations must show how to implement decisions in operations
- d. Cover all elements of a standard research process
- e. Consultant teamwork is a must to produce the group product
- f. Recommendations must show how to implement such plans
- g. Recommendations of project must cover both administrative and research elements

Learning objectives for this course using NCHL language and codes.

A4. **Organizing:** L10.3...Impact and influence...Takes multiple actions to persuade

L11.4...Information seeking...Conducts research to maintain (acquire) knowledge

L13.2...Initiative...Is decisive in a time sensitive situation

L14.4...Innovative thinking...Clarifies complex ideas or situations

L15.3...Interpersonal understanding...Understands individuals

L16.3...Organizational awareness...Understands culture and climate

L18.2...Process management/Organizational design...basics of clinical & non clinical

L19.3...Professionalism...Maintains social accountability

L20.1...Project management...Prepares a detailed project plan

L21.5...Relationship building...Sustains strong personal relationships

L22.3...Self confidence...States confidence in own abilities

L25.4...Talent development...supports on-going development

A5: **Characterizing value:** L3.3...Analytic thinking...Recognizes multiple relationships

L6.3...Communication skills...Makes persuasive oral presentations

L10.3...Impact and influence...Takes multiple actions to persuade

L11.3...Information seeking...Delves deeper

L13.3...Initiative...Acts up to 3 months ahead

L14.4...Innovative thinking...Clarifies complex ideas or situations

II. Intended Audience/Prerequisites

For Individuals who will be in supervisory or above positions requiring applications of quantitative methods to administrative practice.

Prerequisites: A graduate statistics course, preferably with biological bases and administrative and operational research included.

III. Learning Objectives

This course is:

1. heavily dependent on self study, but relies greatly on group production; intended to stimulate project based efforts which are frequently used in the operating world. It will require that each member of a group teach the others what s/he is doing as part of the group effort. No one will be formally designated as the "leader". Each group is intended to be a self directed work group.

2. heavily dependent on each student's being mature enough to be self-disciplined so that the project gets done well without forcing others to do inequitable amounts of work. It will require that each member of a project group assess the performance of each other member. It will require working with others - whether you like them or not - and producing a product in which no one has "done it all" or has been a "piker."

3. heavily dependent on a project group - not only because a "group process" is desired, but as a necessary pooling of time and capability to get the job done. It intends to capitalize on each student's prior knowledge and skill as well as that acquired in this course.

It intends to:

A. have the student structure a model for the chosen project's process or practice. This will require a conceptual model, based on theory, and a "construct" presented in a propositional and/or hypothesis testing mode. (An experimental design approach is acceptable, but not encouraged because primary data acquisition could be too time consuming... given IRB approvals... within the available term.)

The student will have to make explicit the relationships between (among) the variables of the model define them operationally, make explicit the means of measurement as well as the measuring units and how to acquire the data. It will require computer assistance and hence implies data preparation for such processing. It will require a formal analysis, using hypothesis testing, as well as a synthesis of data. It will require presentation of findings, drawing of conclusions and making administrative recommendations in a quantitative mode for an operative setting. The preference is for a "predictive model" (ideal, available and derived) rather than an "explanatory one" but regardless the project is to indicate which of the variables are "amenable" to administrative "control or manipulation." The preference in the recommendations is clearly in favor of highlighting those variables that can be controlled or manipulated by management rather than those which are only better explainers or predictors. (The latter are likely "givens" - at least from management's point of view - in the context of the project. This may require two separate multivariate analyses.)

B. emphasize "how to apply" quantitative logic to practice rather than "how to do statistical methods." This means that the student will feel s/he is at the margin of understanding of what is really "going on within the black box of canned computer routines." The critical learning is how to prepare data for input and how to interpret the output, not how to do the calculations. Each student is expected to have "interfaced" with a computer.

C. capitalize on the knowledge and skills of its members. In fact, the instructor would welcome students to Volunteer to prepare and present on some of the listed topics of interest to the class.

IV. Methods of Instruction

1. Didactic sessions with associated exercises and readings will be covered throughout the term. Field project applications are required, but classroom time is allocated. (Class won't meet most of April while you work on the project.) Special individual presentations as part of the teaching sessions are encouraged.
2. Special computer instruction sessions will be held to cover SPSS and selected applications.
3. Students are to work in "project team" groups on a project (data set) of their choice. The groups (5 members is the preferred size) will be created to make the groups "equivalent" in prior computer skills, inferential statistics and, hopefully, analytic writing. (A major challenge will be to assemble the groups to assure be a mix of student skills who have a prior "computer analysis" experience in each group.) Groups will meet at least by the second class session and subsequently meet as indicated/needed for project work.
4. After the groups are formed, they should decide on possible project sources (sites) and potential topics of interest to the group. Acquiring a data base is a key consideration. After meeting as separate groups at a site(s) of their choice, each group is to hand in the following:
 - a. site (data source) liaison person
 - b. computer liaison person
 - c. site (including the contact person at the site or for the data set)
 - d. tentative proposition for the study
 - e. dependent variable-**assuring** it is a continuous one
 - f. sketch of an "ideal" conceptual model (plus fishbone diagram if meaningful to group) as a minimum.
5. A draft proposal (an expanded outline of about 2-3 pages) shall be submitted (nothing fancy, but readable as the first "project progress review.") This shall include:
 - a. the formal proposition of the study - clearly defined analytic model, a problem statement and example working hypotheses in words; (include conceptual model/analytic model diagram)
 - b. dependent variable and independent variables and possible analytic models;
 - c. specific data sources and their acquisition methods;
 - d. data acquisition and processing support of the site;
 - e. specific function of each group member;
 - f. first pass PERT CHART for the project (does NOT require a CPM analysis, initially)
 - g. anticipated outcome (at most one paragraph summarizing potential findings, results, conclusions, recommendations.
6. The second "project progress reviews" need not be written unless the project changed from the first report. Teams should schedule time during the class period if they need to meet with the instructor.
7. The team verbal reports will be given Tuesday and Thursday (We'll have to start class early those days.) two weeks before the end of the term. They will be "compact"--to permit presentation (30 minutes) plus questions (10 minutes) and a written peer assessment (5 minutes) plus a 5 minute break. Presentation aids are expected. Each person must personally present verbally and also assess in writing all peer groups.
8. Quant Players QP 1-6 cover 15 minute presentations by each group of students on the Quant topics of the week. It is intended to provide a venue for students' "hidden talents" to be displayed to help make Quant "live". Make it a show...skits, musical instruments, etc... as well as an academically substantive session.

V. Grading:

The course grading performance will be based chiefly on the project which includes both the verbal and written report, but individual performance will be used (see items 4 and 5).

1. A project done to "get by" (S or C) means that the students are willing to have the paper presented as evidence of performance to their advisors (mentors) and/or site people.
2. A project done "creditably" (B) means sufficiently well to be publishable (if written to comply with the journal's format) in a general journal of the field. (This is the "expected" group performance.) Other grades, higher or lower, will be earned by students when justified, regardless of the group grade.
3. A project done in an "excellent" manner (A) means that it is potentially publishable (if written to comply with a journal's format) in a specialized journal which is "refereed."
4. Individual performance requires that all assigned exercises be done; that the required "sentences" from the readings are submitted weekly; that attendance in didactic classes as well as group sessions occur without exception; that each member of the group submits a report to the instructor (after the written project has been submitted) of performance by each member of his/her own group to justify individual grades that are different from the group grade if performance by the individual is really different. If anyone does not distinguish peer performance the highest attainable grade is a B. Each student will also provide an assessment of each verbal project report that is given the final class days by scoring, grading and ranking.
5. Each student must submit in his/her own words an analysis (description and interpretation) with an application of one of the multivariate analytic methods applied to project data (Can NOT be the same analysis as was done for the project) along with the relevant printout of the data analysis.

VI. Specific Readings: You Must read them for each class period.

Excerpts of "reference texts" by Griffith, Eck Seidel and Warner are provided.

Quantitative Techniques for Hospital Planning and Control by Griffith (Lexington Books) (with a companion Exercises - use prn)

An Introduction to Quantitative Methods for Business Application by Eck (Wadsworth Publishing Company)

Required:

Decision Making and Control for Health Administration by Warner and Holloway (Health Administration Press)

Applied Quantitative Methods for Health Services Management By Seidel, Gorsky and Lewis (Health Administration Press)

VII. Originally **authored material** is included on selected topics. Handouts and manuals are cited on the course outline. References include the manual of Quant, Stat and Research from ISP, which is annually updated.

VIII. The **course schedule and outline** is given as a separate document. The sentence assignments must be handed in weekly and the exercises as listed on the schedule.

IX. Computer Skills:

There are computer skills needed to fulfill the course requirements. To assist in their acquisition, there will be separate input sessions on SPSS, data files, crosstabs, multiple linear regression and discriminant analysis. No specific **computer** exercises on Linear Programming or PERT or EOQ or queuing are included although the student is encouraged to use the existing computer software available to do the class assignments.

The sessions are scheduled to link with, but lag, the class topics. They are taught by Dean McWilliams in C-381 Mayo. (See separate handout.)

The 4 topics are:

- a. SPSS Basics
- b. Chi Square
- c. Regression Applications
- d. Discriminant Analysis

There will be handouts for each session. A computer question/answer session, when you are working on processing your data, can be scheduled with Dean.

2. The computer application exercises are all related to an existing data file that will be available. SPSS is used since both MLR and DA must be run inductively. (Dean McWilliams can help you copy the file). You will need to use it to complete the required exercises. You will need to run cross tabs, MLR and DA on this database. You will need to hand in (at least show the instructor hard copy that you have personally run each of them). They must be done on schedule or you will be buried as the term progresses.