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ABSTRACT

The massage therapy profession is currently engaged in a competency-based education movement that includes an emphasis on promoting massage therapy research competencies (MTRCs). A systems-based model for integrating MTRCs into massage therapy education was therefore proposed. The model and an accompanying checklist describe an approach to designing an instructional unit that includes the following phases: (1) preparing instruction (developing a unit description, rationale, and performance objectives; identifying and/or assessing prerequisite competencies; and delineating and sequencing topics by way of an advance organizer); (2) implementing instruction (selecting instructional methods; developing and assigning student learning activities; and selecting and using instructional resources; and (3) evaluating instruction (devising and using an evaluation system that includes formative evaluation and learning correctives; designing and conducting a criterion-referenced summative evaluation to determine a student's grade at the end of the unit based on demonstrated mastery of the unit's prescribed performance objectives; and conducting a unit evaluation to give students an opportunity to assess the unit's instructional quality). (The bibliography lists 11 references. The appendix presents an illustrative instructional unit on the experimental research process for use in a core research course in a massage therapy school's curriculum, a massage therapy continuing education workshop/minicourse, or a networking seminar involving diverse health science professionals.) (MN)

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Running head: INTEGRATING RESEARCH COMPETENCIES

Integrating Research Competencies in Massage Therapy Education

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Paper presented via poster session at the annual meeting of the American Massage Therapy Association; Portland, OR; October 2002

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Abstract

The massage therapy profession is currently engaged in a competency-based education movement that has as one of its several focal points an emphasis on promoting massage therapy research competencies (MTRCs). One of several dimensions that must be seriously considered if we are to advance MTRCs in our profession is that of the curricular and instructional contexts for teaching these skills (see Hymel, 2001). It is precisely to this dimension that this paper speaks in proposing a systems-based model for integrating research competencies in massage therapy education. Specifically, basic guidelines are suggested for preparing, implementing, and evaluating instruction at the unit or module level. An illustrative unit titled “The Experimental Research Process” is provided as an exemplar that could serve any one or more of the following functions: (a) an initial unit among several constituting a core research course in a massage therapy school’s curriculum; (b) a self-contained unit as part of a continuing education workshop or mini-course; and (c) a generic unit for a networking educational seminar among diverse health care professionals.

Integrating Research Competencies in Massage Therapy Education

The massage therapy profession's current focus on ensuring that licensed/certified practitioners are research literate has been apparent in the recent efforts of several notable leaders in our ranks (e.g., AMTA Foundation, 2002; Kahn, 2001a, 2001b; Ostendorf & Schwartz, 2001). Looming on the not-too-distant horizon is the March 2003 date mandated by the Commission on Massage Therapy Accreditation (COMTA) for the inauguration of specific competency-based standards for massage therapy and bodywork educational programs—inclusive of a standard for research-based competencies.

With this development in mind, I have suggested in an earlier paper the following eight dimensions that must be considered if we are to advance in a comprehensive way the acquisition of massage therapy research competencies (MTRCs) by members of our profession: (a) Dimension #1—Curricular & Instructional Contexts for Teaching MTRCs; (b) Dimension #2—Application Tasks for Demonstrating MTRCs; (c) Dimension #3—Learning Activities for Enhancing MTRCs; (d) Dimension #4—Print, Electronic, & Personnel Resources; (e) Dimension #5—Varieties of Massage Therapy Research Documents; (f) Dimension #6—Potential Research Strategies; (g) Dimension #7—Potential Areas of Inquiry in Massage Therapy Research; and (h) Dimension #8—Organizational Contexts for Supporting Massage Therapy Research. It is primarily to the first of these eight dimensions that this paper speaks in elaborating on the curriculum development and instructional design contexts for advancing MTRCs.

The Scope of Curricular & Instructional Contexts for Teaching MTRCs

Perhaps the most basic context in which MTRCs might be taught is that of a *core research course* being included in the massage therapy school's curricular offerings.

Positioning such a course among the initial courses required in a massage therapy program would allow for concurrent and subsequent coursework to build on those research skills developed at the outset of one's studies. A strongly recommended follow up or sequel to this core research course might be that of a *research skills instructional unit or module* placed at the beginning of each of their other individual massage therapy courses throughout the curriculum, thus allowing the students to apply their earlier-acquired research skills to the unique issues and demands now confronting them in a specific course.

A third possible context for teaching MTRCs is that of *continuing education workshops or mini-course*. This would be an appropriate route not only for massage therapy educators preparing to infuse their curriculum with research-focused instructional units, but also for in-service practitioners whose earlier education predated the current research emphasis. Finally, a fourth context involves *networking educational seminars for interested health care professionals* who might have overlapping interests in the research agendas of massage therapists.

Whether the context for teaching MTRCs be that of a *core research course, research skills instructional unit/module, continuing education workshop or mini-courses, or networking educational seminar*, a systems-based model approach to competency-based education is available that provides explicit guidelines for designing instruction at the *course syllabus* and *instructional unit* levels (Hymel, 1984). What follows is an explication of those generic guidelines pertinent to designing an instructional unit, with a specific illustration of an over-arching unit on the experimental research process that might be of use to massage therapy educators as we begin the quest to make our profession more research competent.

Systems-Based Model for Designing an Instructional Unit

The instructional unit represents the most specific level at which instruction is designed. Accordingly, Figures 1 and 2 represent the systems-based model and accompanying checklist for the *three phases* of the design effort, viz., *preparing*, *implementing*, and *evaluating* instruction. Associated with each phase, furthermore, are specific components that operationalize the preparation, implementation, and evaluation aspects of instruction and the resulting type of documentation that is the instructional unit product.

Phase I: Preparing Instruction

The *unit description* and *rationale* components are features of preparing an instructional unit and should reflect the unit goal specified in the course syllabus. We presume here that the delineation of course goals in the course syllabus reflects in large measure the goals of those units constituting the course.

With respect to the unit rationale, an attempt is made here to justify a given unit in the course by appealing to (a) its unique value as a dimension of the course, (b) its relationship to previous topics as a continuation of or sequel to what has already been covered in the course, and (c) its relationship to future topics as a prerequisite or foundation to material still to be addressed.

The *performance objectives* component is likewise an aspect of preparing instruction at the unit level. It specifies in a detailed fashion the precise behavior (learning) for which the student is to be held accountable after instruction, including an indication of the conditions under which the behavior is to be demonstrated and the proficiency level to be attained. This component should provide a basis for (a) communication between teacher and

Figure 1. Systems-Based Model for Designing an Instructional Unit

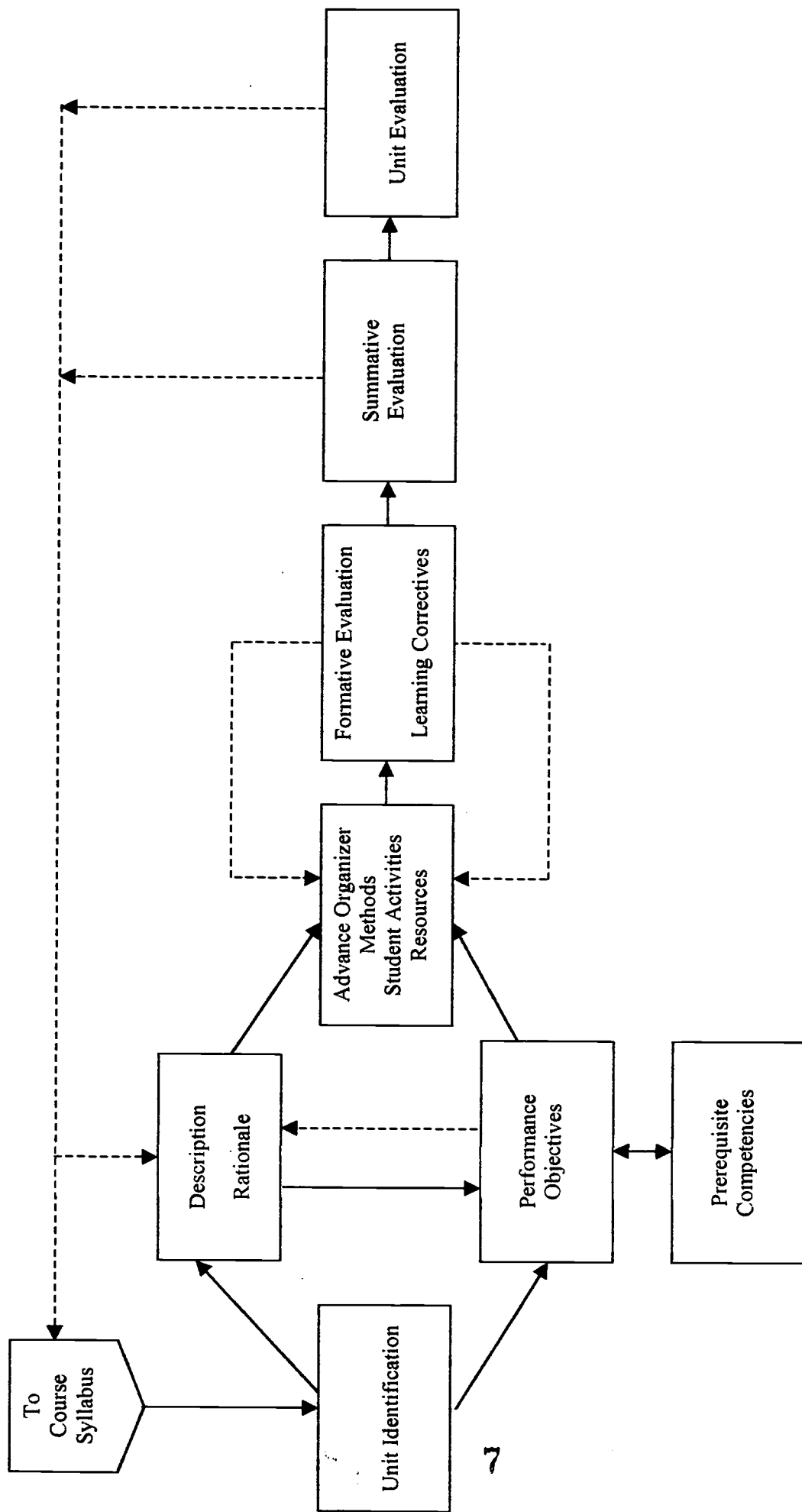


Figure 2. Checklist for Designing an Instructional Unit

	Check When Completed
1. Identify the topic addressed in the unit.	_____
2. Describe in narrative form the subject matter content of the unit.	_____
3. State the rationale for the inclusion and location of the unit in the course.	_____
4. List the performance objectives for the unit.	_____
5. Identify and/or construct a test for prerequisite competencies.	_____
6. Outline in detail (via an advance organizer) the various topics and subtopics which comprise the unit.	_____
7. Identify the instructional methods used in the unit.	_____
8. Identify the various learning activities in which the students will engage as they proceed through the unit.	_____
9. Specify the resources utilized in the unit.	_____
10. Construct a formative test that addresses itself to the performance objectives of the unit and that serves a diagnostic purpose.	_____
11. (a) Identify various activities and assignments of a review and/or remedial nature to which a student would be recycled in order to correct certain learning deficiencies uncovered by the formative test.	_____
(b) Prepare a form that reports the results of the formative test and establishes a correspondence between items missed on the formative test and learning correctives.	_____
12. Construct a summative test that addresses itself to the performance objectives of the unit.	_____
13. Construct a unit evaluation form that would be used to facilitate student feedback relative to the effectiveness of the instructional unit.	_____

student as to behavioral expectations, (b) planning on the part of both teacher and student, and (c) evaluation of student performance and instructor effectiveness.

Another component of the unit that relates to the preparation of instruction involves the identification and/or assessment of *prerequisite competencies*. Because the progression in learning is obviously from the known to the unknown, it is important that a determination be made of the exact prerequisite competencies required of, and supposedly possessed by, the student upon entry into the unit. Otherwise, the appropriate starting point in the presentation of a new topic would not be known by the teacher.

Whether the prerequisite competencies appropriate to a unit are simply identified by the instructor for the benefit of the students or actually assessed by the teacher is partially a function of the nature of the material to be covered. The former would probably suffice if the material were not highly sequential or hierarchical; otherwise, both the identification and assessment of prerequisite competencies might be in order.

A final component related to the preparation of instruction involves the delineation and sequencing of topics comprising the unit by way of an *advance organizer*. This is typically a written aid that students can use to help them relate the potentially meaningful material to be learned to the cognitive base (structure) they already possess.

The advance organizer provides students with a general overview of the more detailed material prior to their actual encounter with it. Although the typical advance organizer is a written narrative that makes use of the student's established knowledge to increase the familiarity and learnability of the new material, other formats such as a topical outline, schematic illustration, flowchart, videotape, or demonstration may be employed.

Phase II: Implementing Instruction

Quite obviously, the *instructional methods* selected and used by the teacher in a unit as well as the *student learning activities* assigned for completion in and out of class are features of implementing instruction. Of particular note here is the necessity for the instructional methods and student activities to reflect the performance objectives of the unit.

Instructional *resources* naturally represent another facet of implementing instruction. The teacher can select from commercially-prepared resources, instructor-developed resources, and resource personnel in an effort to augment those teaching methods and learning activities decided upon earlier.

Phase III: Evaluating Instruction

As indicated in the systems-based model for designing an instructional unit, *formative evaluation* and *learning correctives* represent two important components. Although they are crucial sequels to the initial delivery of instruction on unit topics, and perhaps could be justified as aspects of implementing instruction, they are cited here as components of the evaluation phase which have a pronounced instructional value.

Formative evaluation (variously known in the present context as criterion-referenced trial testing, practice testing, or diagnostic testing) provides ongoing, intermittent feedback to the teacher and student covering the latter's progress at various stages in a given unit of instruction. This form of criterion-referenced testing occurs several times prior to the completion of the unit and makes possible the identification of learning deficiencies and the subsequent prescription of alternative remedial measures. Formative evaluation, then, provides the "diagnostic" part of any attempt at diagnostic-prescriptive teaching.

As the flowchart indicates, the results of the formative testing suggest the effectiveness/ineffectiveness of the sequencing of topics via the advance organizer, the instructional methods, the learning activities, and the resources used at various stages in the unit. In those instances where the formative test results indicate a learning deficiency on the part of the student, learning correctives may be prescribed. These may include alternative ways of sequencing the material, delivering instruction, involving students via assignments, and employing resources. The learning correctives, then, represent the “prescriptive” part of any attempt at diagnostic-prescriptive teaching.

The *summative evaluation* component of this model refers to a criterion-referenced assessment at the end of the unit to determine a student’s numerical/letter grade as based on demonstrated mastery of the unit’s prescribed performance objectives. This would apply, of course, primarily in an instructional unit for which academic credit is being awarded. Appropriate adjustments would necessarily be made here if the context for the unit were that of a continuing education effort or networking educational seminar experience.

Finally, the *unit evaluation* component refers to the students’ opportunity to assess the instructional quality of the unit (perhaps via a brief questionnaire) and to the type of achievement distribution attained on the summative test if the unit were part of an academic credit experience. In this latter regard a negatively skewed distribution curve would suggest instructional effectiveness assuming it was obtained in the context of a valid and reliable testing instrument.

An Illustrative Unit Overviewing the Experimental Research Process

The appendix which follows contains an illustrative instructional unit titled “The Experimental Research Process—An Overview of Essential Concepts, Principles, & Procedures.” This unit could very well serve any one or more of the following functions: (a)

an initial unit among several constituting a core research course that is part of a massage therapy school's curriculum; (b) a self-contained unit that is the focal point of a massage therapy continuing education workshop or mini-course; and (c) a generic unit that give direction to a networking educational seminar among diverse health science professionals. As the title suggests, its intent would be to provide a grand-mosaic, panoramic view of the experimental research process that could serve as a foundation for more in-depth work on the individual stages of the research endeavor.

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Appendix

An Illustrative Instructional Unit
Overviewing the Experimental Research Process

UNIT TITLE: The Experimental Research Process—An Overview of Essential Concepts, Principles, and Procedures

UNIT DESCRIPTION: This instructional unit provides a comprehensive survey of those essential concepts, principles, and procedures that define the experimental research process. The specific issues covered are intentionally generic in nature and lend themselves to applications across diverse fields in the behavioral and health sciences.

UNIT RATIONALE: This unit is predicated on the belief that the research process traditionally designated as true experimental is most inclusive of those concepts, principles, and procedures that constitute scholarly inquiry which is both rationalistic and empirical. Furthermore, this unit contends that the true experimental research process is an appropriate base from which to consider alternative research strategies that to lesser and greater degrees differ from the true experimental model. Accordingly, the topics surveyed here should provide an appropriate baseline from which (a) greater elaborations on true experimentation can proceed and (b) necessary deviations from true experimentation can ensue when the research questions at hand require it.

PERFORMANCE OBJECTIVES: Upon completion of this instructional unit, and without access to reference notes and materials, the student should be able to complete the following tasks with 90% accuracy:

1. Differentiate among the following terms: measurement, statistics, research, and evaluation.
2. Given an illustrative vignette or case study of a true experimental investigation appropriate to the student's behavioral and/or health science area of study, identify and explain the role played by each of the following research components:
 - a. research question and professional literature review;
 - b. population and sample;
 - c. random selection and random assignment;
 - d. variables of an independent, dependent, extraneous, control, confounding, and intervening nature;
 - e. research, null, and alternative hypotheses;
 - f. parameter & statistic;

- g. statistical testing and inference; alpha level or probability of a Type I Error; p value or level of significance; statistical power;
 - h. internal and external validity;
 - i. experimental research design notation.
3. Characterize the nature of a difference-oriented research strategy.
 4. Discuss the distinctions among and recognize case illustrations of the following three types of difference-oriented research strategies:
 - a. true experimental;
 - b. quasi-experimental;
 - c. ex post facto.
 5. Characterize the nature of an association-oriented research strategy.
 6. Discuss the distinctions between and recognize case illustrations of the following two types of association-oriented research strategies:
 - a. simple correlational study;
 - b. predictive study.
 7. Characterize the nature of a descriptive-oriented research strategy.
 8. Discuss the distinctions among and recognize case illustrations of the following five types of descriptive-oriented research strategies:
 - a. case studies;
 - b. observational studies;
 - c. surveys;
 - d. archival studies;
 - e. content analyses.
 9. Discuss the nature of a research strategy as a critical determinant of statistical usage.

10. Characterize the role of statistics as a research tool and distinguish between descriptive statistics and inferential statistics.
11. Critically analyze a true experimental study from the professional literature in your area of study using the concepts, principles, and procedures addressed in this unit.
12. Discuss the major ethical considerations prevalent in research in your professional area of study.

PREREQUISITE COMPETENCIES: None

ADVANCE ORGANIZER VIA TOPICAL OUTLINE:

- I. Measurement, Statistics, Research, & Evaluation: The Continuum
- II. The Experimental Research Process: A Grand-Mosaic, Panoramic View
 - A. A Vignette/Case Analysis in Massage Therapy Research
 1. Research Question & Professional Literature Review
 2. Population & Sample
 3. Random Selection & Random Assignment
 4. Variables from a Research Design Perspective
 - a. Independent Variable
 - b. Dependent Variable
 - c. Extraneous Variable
 - d. Control Variable
 - e. Confounding Variable
 - f. Intervening Variable
 5. Hypotheses
 - a. Research Hypothesis
 - b. Null or Statistical Hypothesis
 - c. Alternative Hypothesis

- 6. Parameter & Statistic
 - 7. Statistical Analysis
 - a. Statistical Testing & Inference
 - b. Alpha Level or Probability of a Type I Error
 - c. p Value or Level of Significance
 - d. Statistical Power
 - B. Experimental Validity
 - 1. Internal Validity
 - 2. External Validity
 - C. Experimental Research Design Notation
- III. The Range of Options in the Research Strategy Spectrum
- A. Difference-Oriented Research Strategy
 - 1. True Experimental Study
 - 2. Quasi-Experimental Study
 - 3. Ex Post Facto Study
 - B. Association-Oriented Research Strategy
 - 1. Simple Correlational Study
 - 2. Predictive Study
 - C. Descriptive-Oriented Research Strategy
 - 1. Case Study
 - 2. Observational Study
 - 3. Survey

4. Archival Study
 5. Content Analysis Study
- IV. Overview of Statistics As a Research Tool
- A. Research Strategy As a Critical Determinant of Statistical Usage
 - B. Distinctions between Descriptive Statistics & Inferential Statistics
- V. Major Ethical Considerations Prevalent in Behavioral & Health Science Research: A Review

INSTRUCTIONAL METHODS: The principal instructional methods used in this unit include the following: didactic or expository teaching; vignette or case study analysis; and group discussion.

STUDENT LEARNING ACTIVITIES: The major student assignments constituting the learning activities for this unit are as follows:

1. Complete the designated readings in the assigned textbooks and the illustrative vignette/case study.
2. Analyze the key concepts, principles, and procedures contained in the illustrative vignette/case study.
3. Complete the designated formative tests and review the accompanying learning correctives as needed.
4. Discuss in writing a true experimental study from the professional literature in your area of study using as critical criteria the concepts, principles, and procedures addressed in this unit.

RESOURCES: The principal resources used in this unit are as follows:

1. Chapters in Textbooks
 - a. Ernst, E. (2002). Evidence-based massage therapy: A contradiction in terms? In G. J. Rich's (Ed.), *Massage therapy: The evidence for practice* (pp. 11-25). New York: Mosby.
 - b. Graziano, A. M., & Raulin, M. L. (2000). Chapter 2—Research is a process of inquiry. In A. M. Graziano & M. L. Raulin's *Research methods: A process of inquiry* (4th ed.) (pp. 28-53). Needham Heights, MA: Allyn & Bacon.

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 - d. Menard, M. B. (2002). Methodological issues in the design and conduct of massage therapy research. In G. J. Rich's (Ed.), *Massage therapy: The evidence for practice* (pp. 27-41). New York: Mosby.
 - e. Polgar, S., & Thomas, S. A. (2000). Chapter 1—The scientific method and health research. In S. Polgar & S. A. Thomas's *Introduction to research in the health sciences* (4th ed.) (pp. 3-16). New York: Churchill Livingstone.
2. Internet Resources (Specifics links at each website will be designated in class)
- a. <http://www.abacon.com/graziano>.
 - b. <http://trochim.human.cornell.edu>
3. Vignettes/Case Studies in Behavioral & Health Science Areas (To be identified and distributed in class)

FORMATIVE EVALUATION: Two formative tests for diagnostic purposes, encompassing binary-decision items, will be administered at the mid- and concluding points in this unit. Each test will span approximately 20-25 items.

LEARNING CORRECTIVES: Each item in the two formative tests will be followed by a parenthetical citation that refers you back to an earlier-designated section of the advance organizer and its correlated readings assignments. These should be consulted to clarify any items on a formative test that are answered incorrectly.

SUMMATIVE EVALUATION: A 50-item summative test comprised of multiple choice and short essay items will be administered at the conclusion of the unit for numerical/letter grading purposes. The following proficiency standards will be used: A, 90-100% mastery of objectives; B, 80-89% mastery of objectives; C, 70-79% mastery of objectives; I, below 70% mastery of objectives.

UNIT EVALUATION: A Likert-type questionnaire will be administered subsequent to the summative test in order to obtain your evaluation of this instructional unit. An analysis will also be made of the type of distribution of achievement scores resulting from the summative test.

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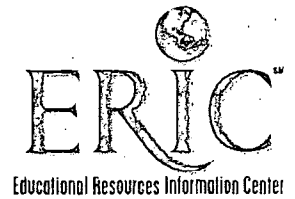
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Dr. Hymel's areas of specialization are educational psychology, research & statistics, positive psychology, and the psychology of personal adjustment. He is a graduate of the Blue Cliff School of Therapeutic Massage (Metairie, LA) and has a particular interest in the areas of stress management, chronic pain, chronic fatigue, and fibromyalgia. He is currently serving as Chair of the AMTA Foundation's Massage Therapy Research Database Committee as well as the Research Grant Review Committee.

Reactions to this paper are indeed encouraged as well as suggestions for collaborative efforts in the many areas of inquiry challenging the massage therapy and bodywork profession today.



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