

THE OHIO STATE UNIVERSITY  
DEPARTMENT OF HUMAN AND COMMUNITY RESOURCE DEVELOPMENT

**AEE 888 - INSTRUMENTATION AND PROCEDURES FOR DATA  
COLLECTION**

Instructor: Larry Miller  
204 Agricultural Administration Building  
2120 Fyffe Road  
Phone: (614) 292-9134  
E-mail: [miller.103@osu.edu](mailto:miller.103@osu.edu)

**Course Description:**

This course addresses the selection, development, and analysis of **various types of instruments and procedures** for collecting research data. The course has a quantitative focus and is oriented toward social science research.

**Course Objectives:**

1. Review the steps in the research process.
2. Create constitutive and operational definitions of variables.
3. Identify and select populations and samples.
4. Differentiate among content, criterion, and construct validity.
5. Select appropriate methods for instrument reliability and validity.
6. Create attitudinal scales, including Thurstone, Guttman, Likert, and semantic differential.
7. Measuring cognitive abilities.
8. Compare and contrast different methods of data collection.
9. Collect data using mail questionnaires, interviews, Delphi technique, Focus Group Interviews (FGI's) and direct observation.
10. Manage non-response errors.

**Course Text:** DeVellis, Robert F. (2003) *Scale Development*, Sage Publications, Applied Social Research Series, Volume 26. (ISBN # 0-7619-2605-4 for paper back edition)

**Course Calendar:**

**Readings:** Textbook chapters are specified by course topics.

Session    Topics

- |   |   |
|---|---|
| 1 | Introduction; Steps in the Research Process; Measurement Concepts – <i>Chapters 1, 2 and 8</i>  |
| 2 | Issues of Error in Instrumentation; Instrumentation Concerns – <i>Chapters 3; 4</i>   |
| 3 | Content, Criterion, and Construct Validity, Types of Reliability, and Statistical Procedures for Reliability -- Same readings as above <i>and Chapter 6</i> |
| 4 | Attitudinal Scales -- Guttman, Thurstone, Semantic Differential, and Likert-Type -- Chapter 5   |
| 5 | Cognitive Measurement -- Chapter 7  |

- 6 Data Collection Concerns, Non-Response Issues; Research Ethics
- 7 Telephone Interviews; Mail Questionnaires
- 8 Focus Group Interviews  
Direct Observational Methods  
Face-to-Face Interviews
- 9 Delphi Techniques
- 10 Final Exam

**Course Assignments:**

**I. Proposal (50%)** This paper will be due at last class before finals week. Prepare a paper with the following sections. Use appropriate style manual and write professionally. The paper should have the following sections/headings (Example proposals available in 204 AA):

1. **Problem/Purpose/Objectives/Definition of Terms**  
Include a brief problem statement, a purpose statement, and research objectives, questions, or hypotheses, and minimum of **two affective variables** with constitutive and operational definitions. You can have more variables.
2. **Instrument/Cover Letter/Validity/Reliability**  
Using one or more of the methods discussed in class, complete the following activities: (a) develop an instrument (using your operational definitions) related to your research topic (for a mail survey), (b) write a cover letter to a panel of experts requesting their assistance in establishing the content validity of your instrument, and (c) explain how you will establish the validity and reliability of your research instrument. Focus on both the format and content of your instrument.
3. **Data Collection: Time Line and Budget**  
Outline the major activities you will conduct to complete your research project. In addition, include a budget that identifies an estimate of the expenses for conducting your research study. Have a colleague (**peer**) review your paper and instrument prior to the due date and comment directly on the paper. Revise the paper. Attach the peer review materials to the final paper you submit; thus, submit peer review and your final revised copy.

**IV. Final Exam (50%) 100 items, multiple-choice exam over the course content.**

**Grading Scale:**

The points you receive will be divided by the total possible points to determine a percentage. Percentages associated with letter grades will be:

<b>A</b>	=	92.5% and higher
<b>A-</b>	=	90.0 - 92.49%
<b>B+</b>	=	87.5 - 89.99%
<b>B</b>	=	82.5 - 87.49%
<b>B-</b>	=	80.0 - 82.49%
<b>C+</b>	=	77.5 - 79.99%
<b>C</b>	=	72.5 - 77.49%
<b>C-</b>	=	70.0 - 72.49%
<b>D+</b>	=	67.5 - 69.99%
<b>D</b>	=	60.0 - 67.49%
<b>E</b>	=	less than 60.0%

**Cell phones and E-mail:** Students are asked to **turn off** their cellular phones before entering the classroom. If it rings I have the right to answer it. While I understand the temptation to play online or check e-mail when you are sitting at a computer, it is important for you to pay attention during class in order to grasp the technology skills we will be discussing. You will have time before and after class to check your e-mail if you wish. The use of any electronic device during exams is prohibited.

Students who are not able to attend the final examination session or submit assignment on scheduled due date because of illness or extenuating circumstances should contact the instructor as soon as they know an absence will occur. Penalty will result from late submission. Fair and equitable extensions will be arranged within university guidelines.

Academic misconduct of any kind will not be tolerated or permitted. If students have questions about what activities constitute academic misconduct and what procedures to follow, they should consult with the instructor. Faculty Rule 335-5-54 will be followed in all cases of academic misconduct: "Each instructor shall report to the Committee on Academic Misconduct all instances of what he or she believes may be an academic misconduct." Students needing special arrangements because of disabilities should contact the instructor.

If you need an accommodation based on the impact of a disability, you should contact me to arrange an appointment as soon as possible. At the appointment, we can discuss the course format, anticipate your needs and explore potential accommodations. I rely on the Office of Disability Services for assistance in verifying the need for accommodations and developing accommodation strategies. If you have not previously contacted the Office for Disability Services, I encourage you to do so.

## **Supplemental Readings(Not required)**

### **Survey Research Methods**

Alreck, P. L. & Settle, R. B. (1985). The survey research handbook. Homewood, IL: Richard D. Irwin.

Bradburn, N. M. & Sudman, S. (1979). Improving interview method and general survey questionnaire design. San Francisco, CA: Jossey-Bass Publishers.

Dillman, Don. (2000). *Mail and Internet Surveys, The tailored design Method, 2<sup>nd</sup> Ed.* John Wiley.

Fink, A. (1995). How to analyze survey data. Thousand Oaks, CA: Sage Publications.

Fink, A. (1995). How to ask survey questions. Thousand Oaks, CA: Sage Publications.

Fink, A. (1995). How to design surveys. Thousand Oaks, CA: Sage Publications.

Fink, A. (1995). The survey handbook. Thousand Oaks, CA: Sage Publications.

Fowler, F. J., Jr. (1995). Improving survey questions. Thousand Oaks, CA: Sage Publications.

Fowler, F. J., Jr. (1993). Survey research methods. Thousand Oaks, CA: Sage Publications.

Moser, C. A. & Kalton, G. (1972). Survey methods in social investigation. (2nd. ed.). New York, NY: Basic Books, Inc.

Rea, L. M. & Parker, R. A. (1992). Designing and conducting survey research: A comprehensive guide. San Francisco, CA: Jossey-Bass.

Stouthamer-Loeber, M. & Bok Van Kammen, W. (1995). Data collection and management: A practical guide. Thousand Oaks, CA: Sage Publications.

### **Sampling**

Cochran, W. G. (1953). Sampling Techniques. New York: John Wiley & Sons.

Fink, A. (1995). How to sample in surveys. Thousand Oaks, CA: Sage Publications.

Henry, G. T. (1990). Practical sampling. Thousand Oaks, CA: Sage Publications.

### **Reliability and Validity**

Berlak, H. (1992). Toward a new science of educational testing and measurement. Albany, NY: State University of New York Press.

Kirk, J. & Miller, M. L. (1986). Reliability and validity in qualitative research. Thousand Oaks, CA: Sage Publications.

Litwin, M. S. (1995). How to measure survey reliability and validity. Thousand Oaks, CA: Sage Publications.

Morris, L. L., Fitz-Gibbon, C. T., & Lindheim, E. (1987). How to measure performance and use tests. Newbury Park, CA: Sage Publications.

Nunnally, J. C. & Bernstein, I. H. (1994). Psychometric Theory, 3<sup>rd</sup> Ed., New York: McGraw-Hill.

Traub, R. E. (1994). Reliability for the social sciences: Theory and application. Thousand Oaks, CA: Sage Publications.

### **Attitudinal Measures**

Fishbein, M. (ed.). (1967). Readings in attitude theory and measurement. New York, NY: John Wiley and Sons.

Henerson, M. E., Morris, L. L., & Fitz-Gibbon, C. T. (1987). How to measure attitudes. Thousand Oaks, CA: Sage Publications.

Mueller, D. J. (1986). Measuring social attitudes: A handbook for researchers and practitioners. New York, NY: Teachers College Press.

Osgood, C. E., Suci, G. J., & Tannenbaum, P. H. (1957). The measurement of meaning. Urbana, IL: University of Illinois Press.

Thurstone, L. L. & Chave, E. J. (1929). The measurement of attitude. Chicago: University of Chicago Press.

### **Mail Questionnaires**

Bourque, L. B. & Fielder, E. P. (1995). How to conduct self administered and mail surveys. Thousand Oaks, CA: Sage Publications.

Dillman, D. A. (1978). Mail and telephone surveys: The total design method. New York, NY: John Wiley and Sons.

Dillman, D. A. (2000). Mail and internet surveys: The Tailored Design Method. New York, NY: John Wiley and Sons.

Erdce, P. L. & Morgan, A. J. (1982). Professional mail surveys. Malabar, FL: Krieger Publishing.

Lockhart, D. C. (ed.). (1984). Making effective use of mailed questionnaires. San Francisco, CA: Jossey-Bass.

Mangione, T. W. (1995). Mail surveys. Thousand Oaks, CA: Sage Publications.

### **Telephone Surveys**

Dillman, D. A. (1978). Mail and telephone surveys: The total design method. New York, NY: John Wiley and Sons.

Frey, J. H. & Oishi, S. M. (1995). How to conduct interviews by telephone and in person. Thousand Oaks, CA: Sage Publications.

Groves, R. H. (ed.). (1989). Telephone survey methodology. New York, NY: John Wiley & Sons.

Lavrakas, P. J. (1993). Telephone survey methods: Sampling, selection, and supervision. (2nd ed.). Thousand Oaks, CA: Sage Publications.

### **Focus Group Interviews**

Aubel, J. (1994). Guidelines for studies using the group interview technique. Geneva: International Labor Office.

Greenbaum, T. L. (1993). The handbook for focus group research. New York, NY: Maxwell Mac Millan International.

Kruger, R. A. (1994). Focus groups: A practical guide for applied research. (2nd ed.). Thousand Oaks, CA: Sage Publications.

Merton, R. K., Fiske, M., & Kendall, P. (1990). The focused interview: A Manual of problems and procedures. (2nd ed.). New York, NY: Free Press.

Morgan, D. L. (1988). Focus groups as qualitative research. Thousand Oaks, CA: Sage Publications.

Morgan, D. L. (ed.). (1993). Successful focus groups: Advancing the state of the art. Thousand Oaks, CA: Sage Publications.

Stewart, D. W. & Shamdasani, P. N. (1990). Focus groups: Theory and practice. Thousand Oaks, CA: Sage Publications.

Templeton, J. F. (1994). The focus group: A strategic guide to organizing, conducting, and analyzing the focus group interview. Chicago, IL: Probus Publications.

Webster, S. & Hollander, L. (1992). Focus groups: An effective marketing research tool for social service agencies. Portland,

ME: National Child Welfare Resource Center for Management and Administration.

### **Face-to-Face Interviews**

- Downs, C. W. & Martin, E., & Smevek, G. P. (1980). Professional interviewing. New York, NY: Harper & Row.
- Fowler, F. J., Jr. & Mangione, T. W. (1989). Standardized survey interviewing. Thousand Oaks, CA: Sage Publications.
- Gorden, R. L. (1987). Interviewing: Strategy, techniques, and tactics. (4th ed.). Chicago, IL: Dorsey Press.
- McLaughlin, P. (1990). How to interview: The art of making questions. North Vancouver, B. C: International Self Counsel Press.
- Rubin, H. J. & Rubin, I. S. (1995). Qualitative interviewing. Thousand Oaks, CA: Sage Publications.

### **Observational Research**

- Boehm. A. E. (1987). The classroom observer: Developing observation skills in early childhood settings. (2<sup>nd</sup> ed.). New York, NY: Teachers college Press.
- Good, T. L. & Brophy, J. E. (1994). Looking in classrooms. (6th ed.). New York, NY: Harper Collins College Publishers.
- Jorgensen, D. L. (1989). Participant observation: A methodology for human studies. Thousand Oaks, CA: Sage Publications.
- Wheelan, S. A. (1979). Do you see what I see?: An introduction to systematic observational methods. Philadelphia, PA: Center for the Study of Psychoeducational Process.
- Wragg, E. C. (1994). An introduction to classroom observation. New York, NY: Routledge.

### **Delphi Techniques**

- Linstone, H. A. & Turoff, M. (1975). The Delphi method: Techniques and applications. Reading, MA: Addison Wesley Publishing.
- Schiebe, M. Skutsch, M. Schofer, J. (1975). Experiments in delphi methodology. In Linstone, H. A. & Turoff, M., The Delphi method: Techniques and applications. Reading, MA: Addison Wesley Publishing.
- Weaver, W. T. (1971). The delphi forecasting method Phi Delta Kappan, 52(5), 267-273.
- Witkin, B. R. (1984). Assessing needs in educational and social programs. San Francisco, CA: Jossey-Bass Publishers.

### **General Educational Research Texts**

- Borg, W. R. & Gall, M. D. (1971). Educational research: An introduction. (2nd. ed.). New York, NY: David McKay Company.
- Creswell, J. W. (1994). Research design: Qualitative and quantitative approaches. Thousand Oaks, CA: Sage Publications.
- Gay, L. R. (1987). Educational research: Competencies for analysis and application. (3rd. ed.) Columbus, OH: Merrill Publishing Co.
- Kerlinger, F. N. (1987). Foundations of behavioral research. (3rd ed.). New York, NY: Holt, Rinehart, and Winston.
- Polit, D. F. & Hungler, B. P. (1995). Nursing research: Principles and methods(5th ed.). Philadelphia, PA: Lippincott.
- Fraenkel, J. R. & Wallen, N. E. (1995). How to design and evaluate research in education (3rd. ed.). New York: McGraw-Hill.

### **Qualitative Research**

- Denzin, N. K. & Lincoln, Y. S. (eds.). (1994). Handbook of qualitative research. Thousand Oaks, CA: Sage Publications.
- Erlandson, D. A., Harris, E. L., Skipper, B. L., & Allen, S. D. (1993). Doing naturalistic inquiry. Thousand Oaks, CA: Sage Publications.
- Lincoln, Y. S. & Guba, E. G. (1985). Naturalistic inquiry. Thousand Oaks, CA: Sage Productions.
- Morse, J. M. (ed.). (1993). Critical issues in qualitative research methods. Thousand Oaks, CA: Sage Publications.

Patton, M. Q. (1990). Qualitative evaluation and research methods. (2nd ed.). Thousand Oaks, CA: Sage Publications.

Strauss, A. & Corbin, J. (1990). Basics of qualitative research. Thousand Oaks, CA: Sage Publications.

### **Graduate Student Helps**

Lake, L. F., Spirduso, W. W., & Silverman, S. J. (1993). Proposals that work: A guide for planning dissertations and grant proposals. Thousand Oaks, CA: Sage Publications.

Ries, J. B. & Leukefeld, C. G. (1994). Applying for research funding: Getting started and getting funded. Thousand Oaks, CA: Sage Publications.

Rossmann, M. H. (1995). Negotiating graduate school: A guide for graduate students. Thousand Oaks, CA: Sage Publications.

Rudestam, K. E. & Newton, R. R. (1992). Surviving your dissertation: A comprehensive guide to content and process. Thousand Oaks, CA: Sage Publications.