

**GEORGE MASON UNIVERSITY  
COLLEGE OF EDUCATION AND HUMAN DEVELOPMENT  
GRADUATE SCHOOL OF EDUCATION  
Ph.D. in Education**

**EDRS 827-DL1: Development and Validation of Assessment Scales**

**3 Credits, Spring 2016**

**PROFESSOR:**

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**COURSE DESCRIPTION:**

**A. Prerequisites/Corequisites**

**EDRS 811: Quantitative Methods in Education**

**B. University Catalog Course Description:**

Focusing on the acquisition of knowledge and skills related to development of assessment scales and validation of assessment scale data in the context of education, psychology, and related fields.

**C. Expanded Course Description:**

N/A

**DELIVERY METHOD:**

This course will be delivered online using an “asynchronous” format via the Blackboard learning management system (LMS) housed in the MyMason portal. You will log in to the Blackboard course site using your Mason email name (everything before “@masonlive.gmu.edu) and email password. The course site will be available on Monday, Tuesday, Wednesday, Thursday, Friday, Saturday, Sunday.

**TECHNICAL REQUIREMENTS:**

To participate in this course, students will need the following resources:

- High-speed Internet access with a standard up-to-date browser, either Internet Explorer or Mozilla Firefox. Opera and Safari are not compatible with Blackboard;
- Consistent and reliable access to their GMU email and Blackboard, as these are the official methods of communication for this course

- Students may be asked to create logins and passwords on supplemental websites and/or to download trial software to their computer or tablet as part of the course requirements.
- The following software plug-ins for PCs and Macs respectively, available for free downloading by clicking on the link next to each plug-in:
  - Adobe Acrobat Reader: <http://get.adobe.com/reader/>
  - Windows Media Player: <http://windows.microsoft.com/en-US/windows/downloads/windows-media-player>

### **EXPECTATIONS:**

- **Course Week:** Refer to the asynchronous bullet below if your course is asynchronous or the synchronous bullet if your course is synchronous.
  - Asynchronous: Because asynchronous courses do not have a “fixed” meeting day, our week will **start** on January 20 and **finish** on May 10.
  - Synchronous: Our course week will begin on the day that our synchronous meetings take place as indicated on the Schedule of Classes.
- **Log-in Frequency:** Refer to the asynchronous bullet below if your course is asynchronous or the synchronous bullet if your course is synchronous.
  - Asynchronous: Students must actively check the course Blackboard site and their GMU email for communications from the instructor, at a minimum this should be three times per week.
  - Synchronous: Students must log-in for all scheduled online synchronous meetings. In addition, students must actively check the course Blackboard site and their GMU email for communications from the instructor, at a minimum this should be \_\_\_ times per week.
- **Participation:** Students are expected to actively engage in all course activities throughout the semester, which include viewing of all course materials, completing course activities and assignments, and participating in course discussions and group interactions.
- **Technical Competence:** Students are expected to demonstrate competence in the use of all course technology. Students are expected to seek assistance if they are struggling with technical components of the course.
- **Technical Issues:** Students should expect that they could experience some technical difficulties at some point in the semester and should, therefore, budget their time accordingly. Late work will not be accepted based on individual technical issues.
- **Workload:** Expect to log in to this course **at least three times a week** to read announcements, participate in the discussions, and work on course materials. Remember, this course is **not** self-paced. There are **specific deadlines** and **due dates** listed in the **CLASS SCHEDULE** section of this syllabus to which you are expected to

- adhere. It is the student's responsibility to keep track of the weekly course schedule of topics, readings, activities and assignments due.
- **Advising:** If you would like to schedule a one-on-one meeting to discuss course requirements, content or other course-related issues, and you are unable to come to the Mason campus, we can meet via telephone or web conference. Send me an email to schedule your one-on-one session and include your preferred meeting method and suggested dates/times.
  - **Netiquette:** Our goal is to be **collaborative**, not combative. Experience shows that even an innocent remark in the online environment can be misconstrued. I suggest that you always re-read your responses carefully before you post them to encourage others from taking them as personal attacks. **Be positive in your approach to others and diplomatic with your words.** I will do the same. Remember, you are not competing with each other but sharing information and learning from one another as well as from the instructor.

### **LEARNER OUTCOMES:**

**This course is designed to enable students to:**

- Understand concepts, procedures, and methodological principles involved in the development of assessment instruments and validation of assessment scale data.
- Understand the contemporary treatment of reliability and validity of assessment scale data.
- Apply procedures and methodological principles underlying the development of assessment instruments.
- Conduct exploratory factor analysis for the validation of assessment scale data using the statistical packages SPSS and Mplus (Muthén & Muthén, 2010) <sup>1</sup>.
- Conduct confirmatory factor analysis for validation of assessment scale data using Mplus.
- Apply classical and modern procedures for scale analysis and validation.
- Read and evaluate scientific articles related to development assessment instruments and validation of assessment scale data in education, psychology, and related fields.

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<sup>1</sup> Muthén, L. & Muthén, B. (2010). *Mplus user's guide*. Los Angeles, CA: Muthén & Muthén (available at: <http://www.statmodel.com>).

### **PROFESSIONAL STANDARDS:**

The student outcomes are informed by the Standards for Reporting non Empirical Social Science Research in Publications of the American Educational Research Association (AERA; *Educational Researcher*, Vol. 35, No. 6, pp. 33–40). Those standards deemed most relevant to addressing the learning targets for the course are those that state that *educators will have the knowledge, skill and disposition to:*

1. Apply basic principles of research practices for specific educational needs
2. Design and operationalize steps for the development of assessment instruments in education research and related fields
3. Evaluate the reliability of assessment scale data in the context of education and related fields
4. Evaluate validity of assessment scale data in the context of education and related fields
5. Conduct classical and modern analysis of assessment scales using contemporary statistical software and interpret the results
6. Use validation research results to disseminate and advance understanding and knowledge related to assessment in education and related fields
7. Recognize the implications of adequate validation of assessment scales for social justice in schools and other professional organizations.

#### **REQUIRED TEXTS:**

Dimitrov, D. M. (2012). *Statistical Methods for Validation of Assessment Scale Data in Counseling and Related Fields*. Alexandria, VA: American Counseling Association.

#### **COURSE ASSIGNMENTS AND EXAMINATIONS:**

1. **Homework Assignments (20%):** Students will be asked to work individually on homework assignments throughout the semester.
2. **Midterm Examination (15%):** Students will take a midterm examination (closed books and notes) to demonstrate understanding and knowledge of course content covered to date of examination.
3. **Final Examination (15%):** Students will take a final examination (closed books and notes) to demonstrate understanding and knowledge of course content covered throughout the coursework.
4. **Pilot Research Study (50%):** This course requires students to develop and conduct a pilot-research study related to development and/or validation of an assessment scale in the context of education. This study is intended to reflect what you have learned from this course. It should be written in a way that one would submit for a national professional conference paper presentation.

Other requirements for this course are designed to build up bases for the final pilot research proposal. Research papers must be handed in on time and must adhere to the APA Publication Manual Guidelines.

#### **This pilot research study will be divided into 4 sequential parts.**

1. Identify a topic of scale development and/or validation in educational context; conduct a literature review; discuss significance of the proposed study; state the purpose of the study and related research questions.

2. Methods – describe the study sample, constructs targeted by the assessment instrument, procedures of data collection, and methods of scale development and validation of assessment scale data.
3. Write the results section.
4. Discussion and Conclusion.

The final paper must be submitted by the last day of class in a research paper format (APA style, see also guidelines posted on the AERA website, [www.aera.net.org](http://www.aera.net.org).) After completing the research study, reflect on that experience. What did you learn from it? How do you think course material helped you carry out the study? [**Scoring rubric** for the research paper is provided in Appendix].

#### **A. Criteria for evaluation**

There are 100 total points for the course, distributed among the homework assignments (20%), midterm examination (15%), pilot research project (50%), and final examination (15%).

#### **B. Grading scale**

Letter grades will be assigned as follows:

<b>A+</b>	97.5 - 100%,	<b>A</b>	92.5 - 97.49%,	<b>A-</b>	89.5 - 92.49%,
<b>B+</b>	87.5 - 89.49%,	<b>B</b>	82.5 - 87.49%,	<b>B-</b>	79.5 - 82.49%,
<b>C</b>	70-79.49%, and				
<b>F</b>	below 70%				

#### **TK20 Performance-Based submission Requirement**

Not Applicable.

#### **GMU POLICIES AND RESOURCES FOR STUDENTS**

- a. Students must adhere to the guidelines of the George Mason University Honor Code (See <http://oai.gmu.edu/the-mason-honor-code/>).
- b. Students must follow the university policy for Responsible Use of Computing (See <http://universitypolicy.gmu.edu/policies/responsible-use-of-computing/>).
- c. Students are responsible for the content of university communications sent to their George Mason University email account and are required to activate their account and check it regularly. All communication from the university, college, school, and program will be sent to students solely through their Mason email account.
- d. The George Mason University Counseling and Psychological Services (CAPS) staff consists of professional counseling and clinical psychologists, social workers, and counselors who offer a wide range of services (e.g., individual and group counseling,

workshops and outreach programs) to enhance students' personal experience and academic performance (See <http://caps.gmu.edu/>).

- e. Students with disabilities who seek accommodations in a course must be registered with the George Mason University Office of Disability Services (ODS) and inform their instructor, in writing, at the beginning of the semester (See <http://ods.gmu.edu/>).
- f. Students must follow the university policy stating that all sound emitting devices shall be turned off during class unless otherwise authorized by the instructor.
- g. The George Mason University Writing Center staff provides a variety of resources and services (e.g., tutoring, workshops, writing guides, handbooks) intended to support students as they work to construct and share knowledge through writing (See <http://writingcenter.gmu.edu/>).

## **PROFESSIONAL DISPOSITIONS**

Students are expected to exhibit professional behaviors and dispositions at all times.

## **CORE VALUES COMMITMENT**

The College of Education & Human Development is committed to collaboration, ethical leadership, innovation, research-based practice, and social justice. Students are expected to adhere to these principles: <http://cehd.gmu.edu/values/>.

**For additional information on the College of Education and Human Development, Graduate School of Education, please visit our website <http://gse.gmu.edu/>.**

### PROPOSED CLASS SCHEDULE

Session	Topic/Learning Experiences	Readings and Assignments
<b>Jan. 11</b>	Introduction to development and validation of assessment scales. Types of scales and scaling process.	Text (Ch. 1)
<b>Jan. 19</b>	Reliability of scale data	Text (Ch. 2)
<b>Jan. 25</b>	Validity of scale data	Text (Ch. 3)
<b>Feb. 1</b>	Steps in development of an assessment instrument	Text (Ch. 4)
<b>Feb. 8</b>	Exploratory factor analysis in scale validation – part 1	Text (Ch. 5)
<b>Feb. 22</b>	Exploratory factor analysis in scale validation – part 2	Text (Ch. 5)
<b>Feb. 29</b>	<b>Midterm Exam</b>	
	<b>Spring Break: Mon Mar 6 – Sun Mar 12</b>	
<b>March 14</b>	Confirmatory factor analysis in scale validation – part 1	Text (Ch. 6)
<b>March 21</b>	Confirmatory factor analysis in scale validation – part 2	Text (Ch. 6)
<b>March 28</b>	Multitrait-Multimethod analysis in scale validation	Text (Ch. 7)
<b>April 4</b>	Conventional scale analysis – part 1	Text (Ch. 8)
<b>April 11</b>	Conventional scale analysis – part 2	Text (Ch. 8)
<b>April 18</b>	Modern scale analysis – part 1	Text (Ch. 9)
<b>April 25</b>	Modern scale analysis – part 2	Text (Ch. 9)
<b>May 2</b>	Modern scale analysis – part 3	Text (Ch.1 – Ch. 9)
<b>May 6</b>	<b>FINAL EXAM</b>	

*Notes:*

1. **Text** = Required text (Dimitrov, 2012).
2. Additional materials (e.g., power point slides and papers) are posted on the Black Board.
3. **Research project** (accounting for 50% of the grade) **is due by May 5**
4. Session dates are provided to coordinate the online schedule of work/assignments by topics.

**APPENDIX  
EDRS 827-DL1**

**RUBRIC FOR RESEARCH PAPER**

GENERAL EVALUATION CRITERIA:

- Clarity and organization
- Comprehensiveness of content
- APA style

**TOTAL SCORE: MAX = 50 pts.**

Performance Elements	Quality Points
<b>Introduction Section</b>	<b>max = 9 points</b>
Statement of the nature and importance of the problem and literature review related to the issues.	<b>4-5 points:</b> The study problem is (a) related to development and validation of assessment scales, (b) described in a parsimonious and complete manner, (c) channeled towards the purpose of the study, and (d) embedded in a literature review on related theory and research.
	<b>2-3 points:</b> The study problem is related to development and validation of assessment scales and overall well described, but it is not channeled towards the purpose of the study or the literature review is not quite on target.
	<b>0-1 points:</b> The study problem is not clearly described, poorly channeled towards the purpose of the study, and not supported well by the literature review.
Justification of the need for this study	<b>2 points:</b> The justification of the study is well described and stems from a necessity to fill up an existing gap in previous development and validation of assessment scales.
	<b>0-1 points:</b> The justification of the study is not well described and/or does not stem from a necessity related to development and validation of assessment scales.
Statement of the purpose of the study and related research questions.	<b>2 points:</b> The purpose of the study is connected to the statement of the problem and the research questions are properly described.
	<b>0-1 points:</b> The purpose of the study is not well connected to the statement of the problem and/or the research questions are not properly described.



<b>Method Section</b>		<b>max = 13 points</b>
Description of the study sample	<b>4 points:</b> Provided is clear, accurate, and complete description of the study sample — sampling method (e.g., random selection, volunteers, etc.), relevant demographic characteristics, sample size (total and by subgroups), and judgments about representativeness of the sample for the targeted population.	
	<b>2-3 points:</b> The description of the study sample is relatively complete, but there are drawbacks related to the description of sampling method, relevancy of demographic characteristics, sample size, or sample representativeness.	
	<b>0-1 points:</b> Provided is a poor description of the study sample, with missing elements related to method of sampling, demographic characteristics, and representativeness.	
Description of the data (instruments, scales, and score reliability)	<b>2-3 points:</b> Provided is clear, accurate, and complete description of the assessment scale data and reliability of scores obtained for the study sample.	
	<b>0-1 points:</b> The description of the data sources is incomplete (or missing) and there is no report on score reliability for the study sample.	
Description of the data collection method	<b>2 points:</b> Provided is clear, accurate, and complete description of the data collection method.	
	<b>0-1 points:</b> The description of the data collection method is incomplete (or missing).	
Description of data analysis methods and procedures used to address the research questions in the project	<b>4 points:</b> Provided is clear, accurate, and complete description of an <i>appropriate</i> design for development and/or validation of an assessment scale.	
	<b>2-3 points:</b> The design for development and/or validation of an assessment scale is appropriate, but there is no sufficient clarity, accuracy, and/or completeness in the description of the design.	
	<b>0-1 points:</b> The design for development and/or validation of the targeted assessment scale is not entirely (or at all) appropriate.	
<b>Results Section</b>		<b>max = 14 points</b>
	<b>8 points:</b> Provided is clear, accurate, and complete presentation of relevant results in APA style by project research questions.	

Within-text presentation of results obtained with the statistical data analysis for each research question	<b>6-7 points:</b> Provided is clear, accurate, and complete presentation of relevant results by project research questions, with some deviations from the APA style.
	<b>5-6 points:</b> Provided is an accurate presentation of relevant results by project research questions, with some deviations from clarity, completeness, and the APA style.
	<b>4-5 points:</b> Presented are relevant results by project research questions, with some deviations from clarity, accuracy, completeness, and the APA style.
	<b>2-3 points:</b> Some results are irrelevant and/or there problems with clarity, accuracy, completeness, and APA style.
	<b>0-1 points:</b> Some results are irrelevant and there are serious problems with clarity, accuracy, completeness, and APA style.
Presentation of tables	<b>2-3 points:</b> The tables include all necessary information presented in APA style.
	<b>0-1 points:</b> The tables do not include all necessary information and /or there APA style problems.
Presentation of figures	<b>2-3 points:</b> The figures are clear and provide relevant information in APA style.
	<b>0-1 points:</b> There are serious problems with clarity of the figures, their relevance, and/or APA style.
<b>Discussion Section</b> <span style="float: right;"><b>max = 14 points</b></span>	
Conclusions drawn from the results, findings and implications for theory and/or practice	<b>8 points:</b> Provided are clear, accurate, and complete conclusions drawn from the study results, comparisons with findings in previous studies on the topic of interest, plausible explanations of the study findings, and implications for theory and/or practice.
	<b>6-7 points:</b> Provided are conclusions drawn from the study results, but there are some minor problems in accuracy and/or sufficiency related to comparisons with findings in previous studies, plausible explanations of the study findings, implications for theory and/or practice, and APA style.
	<b>5-6 points:</b> Provided are conclusions drawn from the study results, but there are relatively serious problems in accuracy and/or sufficiency related to comparisons with findings in previous studies, plausible explanations of the study findings, implications for theory and/or practice, and APA style.

	<p><b>4-5 points:</b> Some conclusions are not well connected to the study results and there are relatively serious problems in accuracy and/or sufficiency related to comparisons with findings in previous studies, plausible explanations of the study findings, implications for theory and/or practice, and APA style.</p>
	<p><b>2-3 points:</b> Some conclusions are not based on the study results and there are more serious problems in accuracy and/or sufficiency related to comparisons with findings in previous studies, plausible explanations of the study findings, implications for theory and/or practice, and APA style.</p>
	<p><b>0-1 points:</b> The conclusions are not connected to (or not based on) the study results and there are serious problems in accuracy and/or sufficiency related to comparisons with findings in previous studies, plausible explanations of the study findings, implications for theory and/or practice, and APA style.</p>
Limitations of the study	<p><b>2-3 points:</b> Provided is clear, accurate, and complete description of limitations of the study and their implications for the study findings and generalization.</p>
Limitations of the study	<p><b>0-1 points:</b> There are serious problems in clarity, accuracy, and completeness of the study limitations and their implications for the findings and their generalization.</p>
Recommendations for future research	<p><b>2-3 points:</b> The recommendations for future research are clearly presented and stem from logical necessity for meaningful replications and/or further extensions of the study design and analyses.</p>
Recommendations for future research	<p><b>0-1 points:</b> The recommendations for future research are <i>not</i> clearly presented and do not address (or justify) the necessity for replications and/or further extensions.</p>