

Graduate Diploma in Professional Development in Education: Educational Assessment, Measurement and Statistics – Unit Content

The course of study involves four existing master's level, semester-length units already in place as part of the Master of Education degree at The University of Western Australia (UWA). These are taught under the auspices of the Pearson Psychometric Laboratory. The four units are equivalent to half of a Master of Education degree. Therefore to enrol, students must be graduates with at least a recognised Bachelor's degree. On successful completion of the four units, participants are awarded with a Graduate Diploma in Professional Education, an existing qualification.

Below are the content, outcomes, and assessment requirements shown in the UWA handbook for five units, of which students choose four. Because of its content and because of the need to deal with classical test theory (CTT), the first unit listed below (*EDUC5638 Introduction to Rasch Measurement Theory*), has been nominated for a change of title: changed to Introduction to Classical and Rasch Measurement Theories. At present, the first five of 12 Lectures are on CTT.

EDUC5638 Introduction to Rasch Measurement Theory

Content This unit begins with an introduction to the historical development of test theory and how modern test theory has superseded classical test theory (CTT) in many applications, especially in large-scale assessments. In particular, students learn how Rasch measurement incorporates, elaborates and better achieves the goals of classical test theory. The unit includes lectures on the formalisation and calculation of traditional reliability and reliability in Rasch models, the concept of validity in both traditional and modern test theory, the concepts of invariance and sufficiency in Rasch measurement, diagnosing the fit of responses to the Rasch model, and the Rasch model for dichotomous items and for items with ordered response categories.

Outcomes Students are able to (1) explain the basic principles of Rasch measurement theory in the social sciences; (2) understand the principles of traditional test theory in terms of Rasch measurement theory; (3) use a range of diagnostic tools in order to assess the quality of items in constructing assessment instruments of achievement, knowledge and attitude; and (4) apply software in analysing assessment data.

Assessment Typically this unit is assessed in the following way(s): (1) nine assignments (70 per cent); and (2) a three-hour open-book examination (30 per cent). Further information is available in the unit outline. Supplementary assessment is not available in this unit.

Texts Enrolled students obtain (1) a set of lecture materials which includes hardcopies of all of the lectures; (2) details of the assignments; (3) the necessary reading materials; and (4) the Study Guide setting out the steps to successfully complete the unit.

Students participate with unit coordinators and other students in an online discussion group. For the duration of the unit, students have the use of the RUMM2030 software, a very easy to use interactive program that analyses data according to the Rasch measurement model.

EDUC5606 Advance Course in Rasch Measurement Theory [PG]

Content This unit introduces students to advanced principles of Rasch measurement theory in the social sciences. It is a follow-up to [EDUC5638](#) Introduction to Rasch Measurement Theory (formerly EDUC8638 Introduction to Rasch Measurement of Modern Test Theory). Topics include fundamental measurement; elementary discrete probability distribution theory; Dichotomous Rasch Model (review of principles; multiple-choice items and guessing); Polytomous Rasch Model; differential item functioning (DIF); fit of responses to the model (analysis of residuals); violations of the assumption of independence (multidimensionality and response dependence; estimating the degree of dependence); analysis of more than two facets; and reporting a Rasch analysis. The unit is delivered entirely online and students study at their own pace. Students receive (1) the study guide; (2) a set of lecture materials; (3) details of the assignments; and (4) selected readings. Students and staff participate in online discussions.

Outcomes Students are able to (1) explain different approaches to measurement including the traditional and modern approaches; (2) explain advanced principles of Rasch measurement theory in the social sciences; (3) use a range of diagnostic tests in order to assess the quality of achievement, knowledge and attitude; (4) write up a Rasch analysis for publication; and (5) apply specialised software in analysing assessment and attitude data.

Assessment This comprises seven assignments (total 55 per cent) and one major project (45 per cent). Supplementary assessment is not available in this unit.

Texts Enrolled students obtain (1) a set of lecture materials which includes hardcopies of all of the lectures; (2) details of the assignments; (3) the necessary reading materials; and (4) the Study Guide setting out the steps to successfully complete the unit.

Students participate with unit coordinators and other students in an online discussion group. For the duration of the unit, students have the use of the RUMM2030 software, a very easy to use interactive program that analyses data according to the Rasch measurement model.

Prerequisites: [EDUC5638](#) Introduction to Rasch Measurement Theory (formerly EDUC8638 Introduction to Rasch Measurement of Modern Test Theory) or the equivalent.

EDUC5636 Assessment and Measurement [PG]

Content This unit develops an understanding of the fundamental concepts of assessment and measurement necessary for systematically investigating developmental continua, designing and constructing assessments, using information from assessments, and evaluating the quality of assessments. By introducing the concept of quantity, the unit builds up to a definition of measurement which is standard for any phenomenon—physical, biological or cognitive. It also discusses the use and construction of measuring instruments. The unit is concerned with measurement as a process in which assessments are deliberately constructed to measure particular abilities, data are generated and inferences drawn. The unit builds towards a framework within which to understand fundamental principles and features of the process of educational assessment and measurement. As basic principles are explained, actual examples

are referred to in order to make the principles and their importance tangible. The materials are structured so that students develop an understanding of all key facets of the process of assessment and measurement before focusing on a particular area.

Outcomes Students are able to (1) understand the fundamental concepts of assessment and measurement theory; (2) use understandings of measurement theory to investigate developmental continua; (3) design and construct assessments; and (4) apply software to analyse assessment data.

Assessment Typically this unit is assessed in the following way(s): (1) a major project in which each student focuses on aspects of the process of assessment and measurement of greatest relevance to work, or of greatest personal interest as a research topic. Further information is available in the unit outline. Supplementary assessment is not available in this unit.

EDUC5637 Measurement and Evaluation [PG]

Content This unit consolidates understandings of the concepts of assessment and measurement necessary for collecting comprehensive information about student performance as a basis for evaluating performance. It considers how cognitive development can be measured through teacher-devised assessments and how information about student performance can be used in combination with information from standardised testing programs to provide pictures of individual and group performance. A key principle is that the quality of assessments of individuals is fundamental to the quality of assessment of groups. State-standardised testing programs, such as the National Assessment Program Literacy and Numeracy (NAPLAN) and the Monitoring Standards in Education (MSE) program, are discussed in tandem with other measures of cognitive development. Focusing on the principles of quantitative educational research and evaluation, the unit examines the evaluation of both individual and group performance. The unit covers key descriptive methods for interrogating and presenting student results. It introduces simple statistical principles relevant to the interpretation of results including the relevance of student numbers and the implications of changes in cohorts over time; the concept of value adding and strengths and limitations of approaches to evaluating value adding; and key features of data analyses such as those used in Data Club. The unit also identifies appropriate and inappropriate methods of aggregating the results of individuals to evaluate the performance of groups and explains the underlying principles in terms of maximising appropriate use of information.

Outcomes Students are able to (1) consolidate various understandings of assessment and measurement principles; (2) learn how cognitive development can be measured through teacher-devised assessments; (3) apply software to analyse assessment data; and (4) apply their understanding of measurement principles in evaluating individual and group performance.

Assessment Typically this unit is assessed in the following way(s): (1) assignment 1 (40 per cent); and (2) assignment 2 (60 per cent). Further information is available in the unit outline. Supplementary assessment is not available in this unit.

EDUC5633 Quantitative Inquiry [PG]

Content This unit focuses on the principles of research design and the analysis of quantitative data from research and evaluation studies in education and the social sciences. Topics include reliability, validity, the interpretation of quantitative data and the development of measuring instruments and scales.

Outcomes Students are able to (1) critically analyse reports from assessment and evaluation studies in education and the social sciences; (2) identify appropriate techniques for the analysis of quantitative data; and (3) interpret and present the results of such analyses in an appropriate format.

Assessment This is based on two or more written submissions. Further assessment information is provided in the unit outline.
Supplementary assessment is not available in this unit.

Advisable prior study: [EDUC5631](#) Approaches to Research (formerly EDUC8631 Approaches to Research) *or* EDUC9643 Master's Thesis Phase I *or* equivalent