



University of the
West of England

MODULE SPECIFICATION

Code: USPJEA-20-3 **Title:** Psychometrics and Psychological Test Construction **Version:** 4

Level: 3 **UWE credit rating:** 20 **ECTS credit rating:** 10

Module type: Standard

Owning Faculty: Health and Life Sciences **Department:** Psychology

Faculty Committee approval: Quality and Standards Committee **Date:** March 2011

Approved for Delivery by: N/A

Valid from: September 2011 **Discontinued from:**

Pre-requisites:
USPJLA-30-2 Research Design and Analysis 2

Co-requisites:
None

Entry Requirements:
N/A

Excluded Combinations:
None

Learning Outcomes:

By the end of this module, the student will have:

Examined classical and contemporary perspectives on test construction

Explored the role of relevant multi-variate techniques (in particular, factor analytic methods) to the design of tests, and other statistical approaches used in scale construction and test evaluation.

Learned how to critically evaluate the technical adequacy of psychometric measures and their suitability for particular applications

Gained familiarity with examples of significant test types (such as measures of ability, attainment, personality, attitudes and values) and of methods used for alternative applications (eg selection, guidance, educational, developmental and clinical assessment)

Critically appraised models of human characteristics informing the design of specific tests

Developed basic skills in test administration, scoring, norming and feedback as a means of gaining understanding of the 'real-world' issues in test choice and use, and to gain awareness of how test design and construction issues are necessarily influenced by these.

Considered contemporary debates on ethical usage of tests

Considered contemporary debates on cultural and equal opportunities issues relating to test design and use.

Syllabus Outline:

Test standards and qualifications
Principles of standardised test administration
The experience of being tested - factors influencing test performance.

Norm-referenced, criterion-referenced, domain-referenced and self-referenced assessments. Standard scoring systems. Standard Error of Measurement and Standard Error of Difference. Requirements of norms. Sampling, representativeness. Standard Error of the Mean.

Concepts underpinning effective test evaluation. Internal consistency, stability, inter-rater reliability. Restriction of range and attenuation effects. Spearman-Brown formula; split-half, Cronbach α , Kuder-Richardson formulae. Generalisability theory. Item Response Theory.

Concurrent, Predictive, Content, Construct Validity ; Concepts of Convergent and Divergent Validity. Issues in Evaluating Validity; Selection Ratio and Utility Analysis. Introduction to Meta-Analysis and Validity Generalisation

Appraisal of evidence concerning the effectiveness of alternative assessment methods for different applications. Occupational, Educational, Developmental, Clinical and other areas of test application.

Scale Construction and Design

Stages in designing questionnaires. Alternative design principles and methods. Advantages and disadvantages of alternative methods. Scale and Item analyses. Criterion-keying . Introduction to Factor-Analysis. Criticisms of factor-analytic based approaches to measurement. Ipsative Scales.

Ethical and Equal Opportunities Issues in Test Use

Test Interpretation and Feedback.

Interpretation of ability and personality constructs. Influence of theoretical models of human characteristics on test design. Normative, differential and ipsative interpretation.

Corroboration and cross-validation of results. Directive, non-directive, problem-solving and 'expert' approaches to feedback. Test choice and feedback as hypothesis testing. Client characteristics and feedback issues. Communication skills and test use. Written feedback. Implications of use of computer-generated test reports.

Teaching and Learning Methods:

The learning strategies adopted are chosen to ensure that students understanding of theoretical concepts is grounded in direct experience of test design and significant aspects of practice. Learning strategies are varied and informed by Kolb's model of learning which emphasises the need for effective learning to incorporate opportunities for direct experience, reflection, theory building and experimentation. Strategies include :

practice in core skills, supported by guideline reading and student managed preparation for practical work

critical evaluation exercises using example questionnaires, short-versions of manuals etc.

critical reading of papers and discussion in student-led seminars

student managed project work on test design including use of computer technology as appropriate

review and discussion of other pertinent material such as EOC and BPS guidelines, test publishers manuals, brochures and guides, qualification framework documents, test standards etc.

contributions from appropriate specialist staff and outside speakers

Reading Strategy:

All students will be encouraged to make full use of the print and electronic resources available to them through membership of the University. These include a range of electronic journals and a wide variety of resources available through web sites and information gateways. The University Library's web pages provide access to subject relevant resources and services, and to the library catalogue. Many resources can be accessed remotely. Students will be presented with opportunities within the curriculum to develop their information retrieval and evaluation skills in order to identify such resources effectively.

Any **essential reading** will be indicated clearly, along with the method for accessing it, e.g. students may

be expected to purchase a set text, be given or sold a print study pack or be referred to texts that are available electronically, etc. This guidance will be available either in the module handbook, via the module information on Blackboard or through any other vehicle deemed appropriate by the module/programme leaders.

If **further reading** is expected, this will be indicated clearly. If specific texts are listed, a clear indication will be given regarding how to access them and, if appropriate, students will be given guidance on how to identify relevant sources for themselves, e.g. through use of bibliographical databases.

Indicative Reading List:

- Jackson C (1996) *Understanding Psychological Testing* Leicester, BPS. (pb)
- Kline P (1991) *Intelligence : The Psychometric View* London : Routledge (pb)
- Kline P (1993) *Personality : The Psychometric View* London : Routledge (pb)
- Kline P (1993) *The Handbook of Psychological Test Construction* London, Routledge
- Cronbach L J (1990) *Essentials of Psychological Testing* (5th edition) New York : Harper and Row
- Bartram Dave (ed) (1997) *Review of Ability and Aptitude Tests (Level A)*
- Cook M (1993) *Personnel Selection and Productivity* (2nd edition). Chichester : Wiley
- Kline P (1994) *An Easy Guide to Factor Analysis* London : Routledge. (pb)
- Hambleton R et al (1991) *Fundamentals of Item Response Theory* Sage
- Loewenthal K (1996) *An Introduction to Psychological Tests and Scales* Routledge
- Spector E (1992) *Summated Rating Scale Construction - An Introduction* Sage Publications
- Carroll J B (1982) *The measurement of intelligence*. In Sternberg R J (Ed) *Handbook of Human Intelligence* (pp29-120) New York : Cambridge University Press
- Carroll J B & Horn J L (1981) *On the scientific basis of ability testing* *American Psychologist* 36, 1012-1020
- Horn J (1986) *Intellectual Ability Concepts*. In Sternberg R J (Ed) *Advances in the Psychology of Human Intelligence* Volume 3. Hillsdale, N.J. Erlbaum
- Sternberg R J (1988) *Mental Self-Government : A theory of intellectual styles and their development* *Human Development*, 31, 197-224
- Sternberg R J (1979) *The nature of mental abilities*. *American Psychologist* 34, 214-230
- Wolman B B (Ed) (1985) *Handbook of Intelligence : Theories, measurements and applications* New York : Wiley
- Matthews G (1997) *The Big Five as a Framework for Personality Assessment*. In Anderson N & Herriott P *International Handbook of Personality Assessment* Wiley
- Bartram D (1996) *The Relationship Between Ipsatised and Normative Measures of Personality*. *Journal of Occupational Psychology* 69. 25-39
- Saville P & Wilson E (1991) *The Reliability and Validity of Normative and Ipsative Approaches in the Measurement of Personality*. *Journal of Occupational Psychology* 64. 219-238.
- Murphy K R (1997) *Meta-analysis and validity generalisation*. In Anderson N R & Herriot P (Eds) *International Handbook of Selection and Assessment* Chichester : Wiley
- Barrick & Mount (1991) *The Big Five Personality Dimensions and Job Performance : A Meta-Analysis*. *Personnel Psychology*. 41. 1-26

Blinkhorn S & Johnson C (1990) The Insignificance of Personality Testing. *Nature*. 348. 671-2

Tett R & Jackson D (1991) Personality Measures as Predictors of Job Performance. *Personnel Psychology* 44. 703-42

Reilly R R & Chao C T (1982) Validity and fairness of some alternative employee selection procedures. *Personnel Psychology*, 35, 1-62

Schmidt F et al. (1979) Impact of valid selection procedures on work-force productivity. *Journal of Applied Psychology* 64. 609-626

Feltham R et al (1994) Developing Fair Tests. *The Psychologist*. January. 1994. 30-31

Kellett D et al (1994) Fair Testing : The Case of British Rail. *The Psychologist* January 1994. 26-29

Assessment:

Weighting between components A and B (standard modules only) A: 75% B: 25%

FIRST ATTEMPT

First Assessment Opportunity

Component A (*controlled*)
Description of each element
TE1 Timed Essay

Element Wt (Ratio)
(*within Component*)
1

Component B
Description of each element
PRO Scale Design Project
J
CW1 Test Evaluation Exercise

Element Wt (Ratio)
(*within Component*)
2
1

Second Assessment Opportunity (Resit) further attendance at taught classes is not required

Component A (*controlled*)
Description of each element
TE1 Timed Essay

Element Wt (Ratio)
(*within Component*)
1

Component B
Description of each element
PRO Scale Design Projec
J
CW1 Test Evaluation Exercise

Element Wt (Ratio)
(*within Component*)
2
1

EXCEPTIONAL SECOND ATTEMPT Attendance at taught classes is required.

Specification confirmed by**Date**
(Associate Dean/Programme Director)