Key Quality Concepts of Learning Assessment

Regional TALENT Workshop

Ursula Schwantner & Andriy Dubovyk, Australian Council for Educational Research

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Overview

• Introduction to ACER and Centre for Global Education Monitoring (ACER-GEM)
• Key quality concepts for learning assessments
• 14 Key areas of a robust assessment program
• Applying the key quality concepts: The MTEG Model in Afghanistan
• Group work on the 14 key areas
Australian Council for Educational Research

- Australian Council *for* Educational Research
- Established in 1930 as a not-for-profit international research organisation
- ACER’s *mission*: Creating and promoting research-based knowledge, products and services to improve learning
ACER research

Early childhood education

School education

Higher education

Vocational, adult and workplace education

Education and development

Indigenous education

https://www.acer.edu.au/research
Centre for Global Education Monitoring (ACER-GEM)

- Collaboration between ACER and DFAT
- to support the monitoring of educational outcomes worldwide to inform evidence-based education policy aimed at improving educational progress for all learners
ACER-GEM work program

System strengthening

Education 2030

Reviews and analysis
Large-scale Learning Assessments
Large-scale learning assessments

• focus on defined learning domains, based on an assessment framework, may be referenced to a national curriculum;
• can be international, regional or national in scope;
• focus on a particular population (sample-based or census).
Purposes of large-scale assessments

- to establish achievement levels of a particular population in a learning domain
- to monitor progress in learning outcomes over time, between grades
- to investigate associations between achievement and contexts in which learning takes place, and to quantify differences between sub-populations
Data quality and accuracy

• To be effective, large-scale learning assessments need to gather data that provide an accurate reflection of the present situation.

• Data quality and accuracy plays a central role in all phases of developing, implementing, analyzing, and using the data from learning assessments.
Key Quality Concepts for Learning Assessments
Key quality concepts

1. Clarity and consistency of purpose
2. Fitness for purpose
3. Objectivity and independence
4. Transparency and accountability
5. Technical rigour
6. Ethicality and fairness

ACER & UIS (2017)
Key Areas of a Robust Assessment Program
The 14 key areas of a robust assessment program

- Data collection
  - Data management
  - Standardised field operations
  - Sample design
  - Test design

- Making sense of data
  - Data analysis
  - Scaling methodology

- Preparation
  - Reporting & dissemination
  - Policy goals and issues
  - Project team & infrastructure
  - Technical standards
  - Assessment framework
  - High quality cognitive instruments
  - High quality contextual instruments
  - Linguistic quality control

Source: https://www.acer.org/gem/about/approach
Key Area 1: Formulating policy goals and priorities to be addressed with the learning assessment

Clearly articulated policy goals and measurement priorities that are relevant to key stakeholders and inform the content, design and scope of the assessment program.

- Identify education priorities.
- Engage stakeholders.
- Identify how results will be used.
- Evaluate the feasibility of implementing an assessment based on the policy goals and measurement priorities.
Key Area 2: Establishing and managing an assessment team responsible for designing and implementing the learning assessment

An assessment team with dedicated staff that is appropriately skilled and adequately resourced to respond to the diverse demands of designing, implementing, analysing, and disseminating the outcomes of the learning assessment.

- Establish an assessment team.
- Develop capacity where needed.
- Outsource when needed.
- Secure physical infrastructure.
Key Area 2: Establishing and managing an assessment team responsible for designing and implementing the learning assessment

Project management

- Test development
  - Assessment framework development
  - Cognitive instrument development
  - Test design
  - Translation and linguistic quality control
  - Contextual instruments development
  - Software development

- Data management, sampling, scaling, data analysis
  - Sampling
    - Psychometrics
    - Data analysis

- Logistics/Field operations
  - Test administration
    - Quality monitoring
    - Transport, printing, scanning

- Communications
  - Editorial
    - Graphic design
  - Media, internet and public relations
Key Area 3: Formulating and articulating technical standards to guide assessment activities

A key document that clearly describes standards of technical quality for all aspects of the learning assessment, and indicates how standards can be used as part of quality monitoring and reporting.

- Establish a technical advisory committee.
- Determine the details of the technical standards.
  - Sampling.
  - Data.
  - Psychometric.

ACER & UIS (2017)
Key Area 4: Developing an assessment framework

A document that uses a consistent terminology to communicate the purpose and characteristics of the learning assessment to individuals/groups who are working on it and to a broader audience.

- Establish expert committees.
- Develop the framework.
- Consult stakeholders.
- Review the framework.
Key Area 5: Developing high quality cognitive instruments

Cognitive instruments containing items with proven reliability, validity and fairness with regard to the population(s) of interest.

• Establish a team of test developers.
• Establish mechanisms for obtaining input from outside the test development team.
• Develop scoring guides.
• Develop instructions.
• Review, pilot and field trial test items.
Key Area 6: Developing high quality contextual instruments

Contextual instruments containing items with proven reliability, validity and fairness with regard to the population(s) of interest.

- Establish a team of contextual instrument developers.
- Establish mechanisms for obtaining external input and feedback.
- Write contextual items.
- Review, pilot and field trial contextual items.
Key Area 7: Linguistic quality control for translation of cognitive and contextual instruments

Cognitive and contextual instruments that are appropriate, linguistically equivalent, and psychometrically equivalent across multiple languages.

- Develop a translatable source version.
- Provide supporting documentation.
- Recruit and train translators.
- Implement a multi-step process.
- Manage the workflow.
- Analyse field trial statistics.

ACER & UIS (2017)
Key Area 8: Designing the cognitive and contextual instruments

A design that ensures efficiency in sample sizes, balanced assessment content, appropriate assessment length, and stable measures over time.

- Consult psychometricians and item developers.
- Allocate items within and across test forms.
- Allocate items within and across questionnaire/interview forms.
- Allocate forms to participants.
- Layout and proofread the forms.
Key Area 9: Sampling

A sample that, through the use of scientific sampling methods, helps to guarantee appropriate levels of statistical precision and validity in the interpretation of assessment results.

- Develop a sampling plan and select a sample methodology.
- Construct or obtain a comprehensive sample frame of the target population.
- Conduct the sampling.
- Maintain optimal response rates.
- Apply the proper weighting methodology to improve the accuracy of estimates and to obtain correct standard errors.

ACER & UIS (2017)
Key Area 10: Standardised field operations

Field operations that are standardised, documented and monitored to ensure that the data are collected under the same conditions, independent from the administration context, in an efficient and secure manner.

- Develop an operation plan.
- Prepare field operations manuals and documentation.
- Contact sampled institutions and individuals.
- Recruit and train key personnel.
- Check assessment materials.
- Administer the assessment according to standardised procedures.
- Verify and register the return of assessment materials.

ACER & UIS (2017)
Key Area 11: Managing data

A final database that respects respondent anonymity, is free from discrepancies and errors, and is appropriately structured and documented for analysis and dissemination.

- Develop a data management plan.
- Design the codebook.
- Prepare data management and data capture software and hardware.
- Establish and train a data manager and data management team.
- Prepare protocols for data capture, data cleaning, verification and validation.
- Prepare data backup protocols.
- Prepare data documentation and transfer protocols.
Key Area 12: Scaling cognitive and contextual data

Cognitive and contextual data that is scaled using well-developed analytical tools in order to support a range of useful comparisons and to communicate information that is meaningful to a range of users.

- Develop a data analysis plan.
- Choose analytical model.
- Identify scales and possible sub-scales.
- Analyse cognitive data.
- Describe the cognitive scales.
- Analyse contextual data.

ACER & UIS (2017)
Key Area 13: Analysing data

Analytical results that are fully documented and reproducible, and that permit valid and useful inferences about the population(s) of interest

- Develop a data analysis plan.
- Assign sample weights.
- Calculate the standard error.
- Analyse data.
- Analyse trends.
Key Area 14: Reporting and dissemination

Appropriate products and approaches to reporting and dissemination that are tailored to the different stakeholder groups and promote appropriate and effective use of the assessment results by those groups.

- Identify different information needs of stakeholders.
- Develop a dissemination strategy.
- Develop dissemination products.
- Monitor how assessment data are used over time.
ACER
Monitoring Trends in Educational Growth
MTEG in Afghanistan
ACER Monitoring Trends in Educational Growth (MTEG)

MTEG is a partnership model incorporating the key quality concepts and 14 key areas:

- Capacity building in learning assessment
- Measuring learning progression (grades 3–6–9)
- Reporting against SDG 4.1 targets and minimum proficiency levels
MTEG Design

- Growth in cohort Grades 3 – 6 – 9
- Change in Grade performance over time

- Domains: reading, writing, mathematics
- Policy priorities: Learning levels and sub-groups of interest, e.g. gender, location, language of instruction
MTEG in Afghanistan

**Grade 6**
- Implemented in 2013
- Domains: reading, writing, mathematics
- Schools and student questionnaires
- Two languages: Dari and Pashto
- Sample size: 5979 students in 110 schools across 13 provinces
- Paper and pencil

**Grade 3**
- Implemented in 2015/16
- Domains: reading, mathematics
- Schools and student questionnaires
- Two languages: Dari and Pashto
- Sample size: 4936 students from 179 schools across 15 provinces
- Tablet-based assessment
Listen to each word.
Select the correct word for the picture.

- house
- donkey
- mountain
The 14 key areas of a robust assessment program

Data analysis
Reporting & dissemination
Policy goals and issues
Project team & infrastructure
Technical standards
Assessment framework
High quality cognitive instruments
High quality contextual instruments
Linguistic quality control
Test design
Sample design
Standardised field operations
Data management
Scaling methodology

Source: https://www.acer.org/gem/about/approach
# MTEG Partnership Model

<table>
<thead>
<tr>
<th>Key area</th>
<th>ACER</th>
<th>Min Edu Afghanistan</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Policy goals and issues</td>
<td>Advice</td>
<td>Stakeholder consultations</td>
</tr>
<tr>
<td>2. Project team and infrastructure</td>
<td>Advice</td>
<td>Resourcing and coordination</td>
</tr>
<tr>
<td>3. Technical standards</td>
<td>MTEG model</td>
<td>Review and adoption</td>
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<tr>
<td>4. Assessment framework</td>
<td>MTEG model</td>
<td>Review, contextualisation and adoption</td>
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<tr>
<td>5. Cognitive instruments</td>
<td>Item development</td>
<td>Review, contextualisation and adoption</td>
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<tr>
<td>6. Contextual instruments</td>
<td>Questionnaire development</td>
<td>Advice on factors of policy interest; review</td>
</tr>
<tr>
<td>7. Linguistic quality control</td>
<td>Sourced linguistic verification</td>
<td>Translation</td>
</tr>
<tr>
<td>8. Test design</td>
<td>MTEG model for TD</td>
<td></td>
</tr>
<tr>
<td>9. Sample design</td>
<td>Scientific SD, school sampling</td>
<td>Advice, sample frame</td>
</tr>
<tr>
<td>10. Standardised Field Operations</td>
<td>Advice, provision of manuals</td>
<td>Adapted manuals, organised and implemented test administration</td>
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<tr>
<td><strong>11. Data management</strong></td>
<td>Data processing and management</td>
<td>Marking of open-ended responses</td>
</tr>
<tr>
<td><strong>12. Scaling methodology</strong></td>
<td>Scaling using IRT Described proficiency scales</td>
<td>Participation in capacity-building workshops</td>
</tr>
<tr>
<td><strong>13. Data analysis</strong></td>
<td>Conducted data analysis</td>
<td>Participation in capacity-building workshops</td>
</tr>
<tr>
<td><strong>14. Reporting and dissemination</strong></td>
<td>Drafting reports; policy seminars</td>
<td>Review of reports; participation in policy seminars</td>
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MTEG Afghanistan capacity building

• Workshops in areas such as:
  – modern assessment theory and practice,
  – assessment frameworks,
  – item review,
  – linguistic quality control
  – sample design,
  – introduction to IRT,
  – open-response coding,
  – test administration using tablets,

• Consultations and hands-on support
MTEG Afghanistan reports

- Class 6 proficiency
- Class 6 girls and boys
- Class 6 school factors
- Class 3 proficiency
- Monitoring Trends in Educational Growth Assessment Framework for Afghanistan

https://www.acer.org/au/gem/key-areas/system-strengthening/mteg
Key Quality Concepts of Learning Assessment

Contact:

Dr Ursula Schwantner, Senior Research Fellow, ACER-GEM: Ursula.Schwantner@acer.org

Dr Andriy Dubovyk, Manager School Assessment Services and International Development, ACER UK: Andriy.Dubovyk@acer.org
Group Work

Discuss:

1. What are the three key areas your country has strong capacity in?
2. What are the three key areas your country would require additional knowledge and support?
3. Report back

Source: https://www.acer.org/gem/about/approach
References

ACER Centre for Global Education Monitoring (ACER-GEM): https://www.acer.org/gem


American Council for Educational Research Ltd. Melbourne


