Rethinking Assessment and Learning

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GLOBAL MINDSET
Integrating Australia with Asia

Session 3A –Schools

National Assessment and Surveys Online Program –
2013 Tailored test design study

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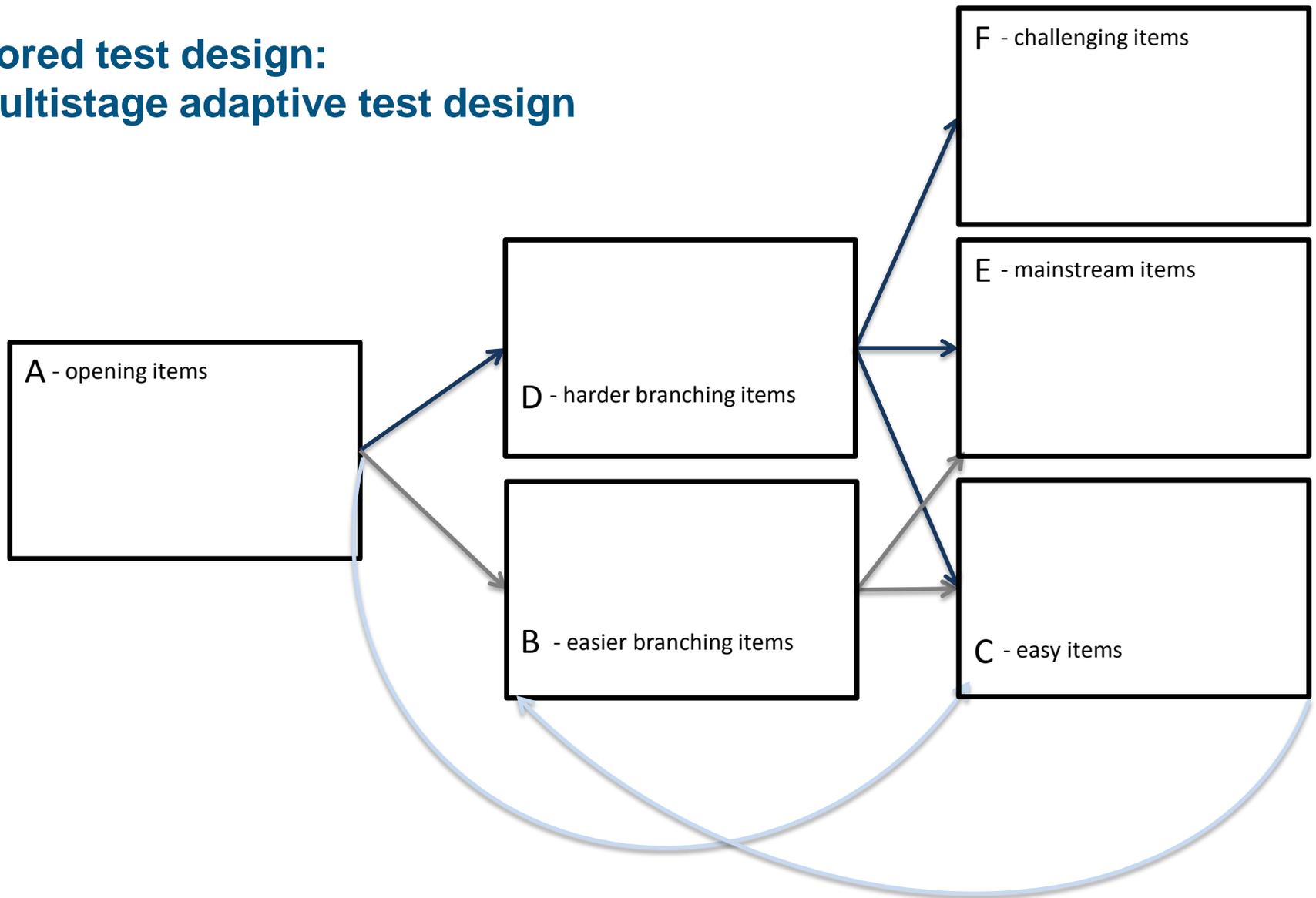
National Assessment and Surveys Online Program

► Funded by the Australian Government Department of Education

► ACARA designed the research program to assist transition of National Assessment Program – Literacy and Numeracy (NAPLAN) to a computer-based assessment.

► NAPLAN assesse all Australian students in Years 3, 5, 7 and 9 in Reading, Writing, Language Conventions and Numeracy

► The key enhancement proposed by ACARA is the use of computer adaptive test design in future NAPLAN tests – the tailored test design.

► ACARA developed and implemented a comprehensive research program:

   1. 2012: Mode effect study

   2. 2013: The tailored test design study

   3. 2014: The development study

Why computer adaptive testing?

► Adaptive testing is based on the concept that more information can be obtained from a test if the test items match the achievement level of the student.

► **Computer adaptive testing** (CAT) – test difficulty is adjusted after response to each item

► **Multistage computer adaptive testing** – test difficulty is adjusted based on responses to a set of items

► For large-scale assessments, multistage testing offers several advantages over CAT, including:

– better control over item content and exposure
– better control over structure and administration of the final test
– requires significantly fewer items to run and maintain the testing program.

► Consequently a multistage adaptive test design – the tailored test design – has been developed and proposed for future NAPLAN online tests.

Tailored test design:
a multistage adaptive test design

F - challenging items

E - mainstream items

A - opening items

D - harder branching items

B - easier branching items

C - easy items

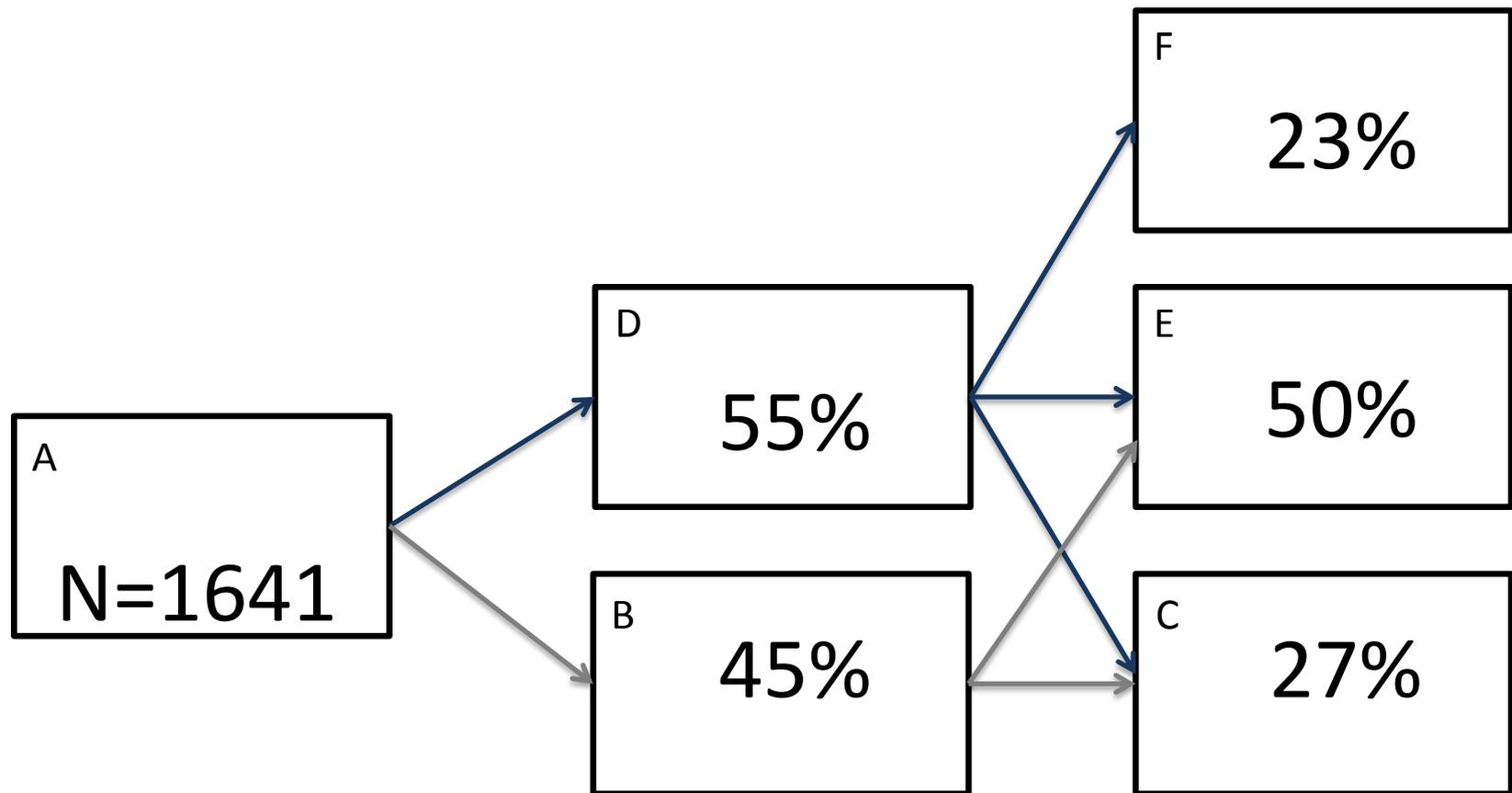acara AUSTRALIAN CURRICULUM, ASSESSMENT AND REPORTING AUTHORITY

Tailored test design study 2013

▶ Main study collected empirical evidence regarding the feasibility of the proposed multistage test design for NAPLAN Online.

▶ Additional studies were conducted to investigate the cognitive and behavioural engagement of students with such a test design.
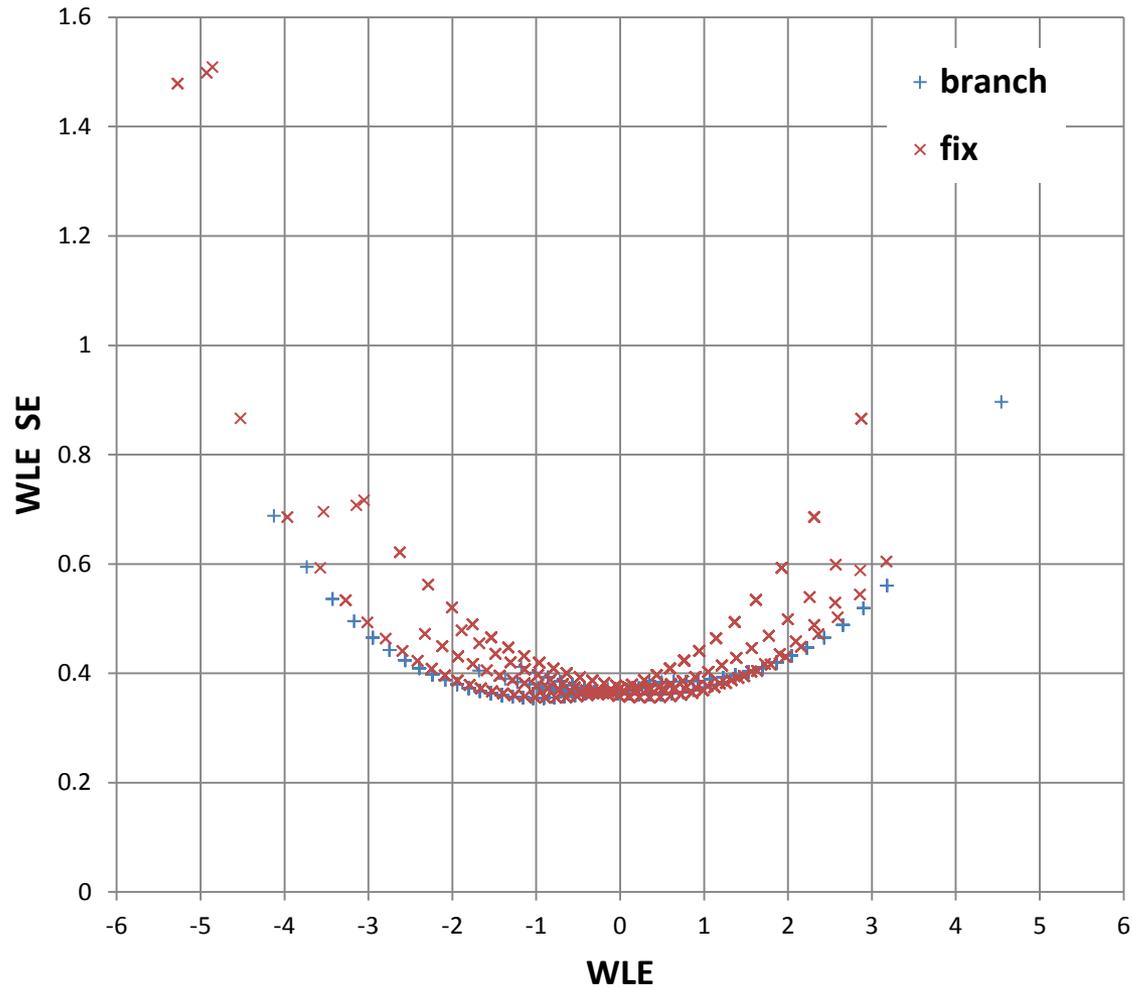
Main study

▶ Testlets were presented in either branching or fixed linear test conditions.

▶ Students randomly allocated to one of these two conditions.

▶ Testlets were constructed using existing NAPLAN items based on paper-based locations.

▶ Simulations were used to determine branching cut-scores.

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TTD study: *Reading Year 5*

F 23%

D 55%

A N=1641

B 45%

E 50%

C 27%

TTD study: *Reading Year 5* student ability estimates

Cognitive and behavioural engagement of students

► Structured observation and interview methods were used to collect information about student interaction with multistage adaptive testing (the tailored test design).

► These methods provide rich qualitative data and about student experiences and insights.

► Studies focused on key aspects of the tailored test design such as branching and rising and falling of difficulty of items in a test.

► Studies also focused on capacity of the tailored test design to address the learning needs of Indigenous and remote students as well as those with socio-educational disadvantage.

Results of cognitive and behavioural engagement studies

► Students regard branching to be a positive enhancement of NAPLAN tests.

► Students were not affected by the raising and falling pattern of item difficulty as they move through different stages of the tailored tests

► Tailored tests enabled educationally disadvantaged students to remain positively engaged with the full test.

► Tailored tests provided a more engaging testing situation and more appropriate test content for most Indigenous and remote students.

► Tailored tests delivered more motivating assessment to all students – including students who might be struggling with the current NAPLAN tests - all students reported an increased sense of achievement.

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Summary key findings

► The delivery of multistage branching tests for NAPLAN online is sound and feasible. These tests offer better measurements of student performance, particularly for high and low achieving students.

► The tailored test design and the proposed branching mechanism work effectively to adapt to the different ability groups.

► The investigation of cognitive and behavioural engagement of students with the tailored test design showed that multistage testing will provide an opportunity to all students – the low achieving students in particular – to be assessed by tests catering more fully for their assessment and learning needs.

► Further work is required to finalise the measurement aspects of the tailored test design; in particular, testlet boundaries require further refinement.

Next steps: 2014 development study

► Refine measurement aspects of the TTD for reading and numeracy

► In-depth cognitive investigation of student interaction with the most challenging items in testlet F in reading and numeracy

► In-depth cognitive investigation of student engagement and interaction with selected technically enhanced item types

► Trial newly developed testlets for grammar and punctuation tests

► Trial newly developed testlets for spelling, including spelling items that use auditory stimuli

► Trial newly developed testlets for reading and numeracy

► Publication of reports is planned for 2015.

THANK YOU

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http://www.nap.edu.au/online-assessment/online-assessment.html

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