Xcalibre 4.1: Comprehensive IRT Analysis

Early in 2011, ASC released the landmark Xcalibre 4.1, the most user-friendly and powerful item response theory (IRT) software in the field. This summer has seen the addition of new functionality and customer requests:

- Mantel-Haenszel differential item functioning (DIF)
- Automatically calculate scaled scores for examinees
- Items with insufficient response frequencies now excluded
- Statistics, scores, and test information files are now optional
- Option for comma-delimited or tab-delimited output
- Meaningful labels for domains provides easier to read output
- Skew, Q1, Median, Q3, IQR now computed for all scores
- -2LL provided to compare fit of competing models
- Item control and item status tables provided in report
- Item-person map plots the distribution of b and \( \theta \) together
- Item parameter and flag table presents the most important results in a single glance

Overview of Xcalibre 4.1

- Produces real report documents – no DOS-style ASCII text output!
- Report includes hundreds of figures and tables already embedded – saving you hours of cut-and-paste
- Output also includes spreadsheets for easy sorting and uploading
- Calibrates 4 dichotomous and 5 polytomous models:
  - 3-parameter dichotomous model, ideal for multiple-choice data
  - 2-parameter dichotomous model, ideal for personality data
  - 1-parameter dichotomous model, with equivalent discriminations
  - Rasch dichotomous model, scaled to items rather than people
  - Rasch rating scale model (RRSM, or RSM)
  - Rasch partial credit model (RPCM, or PCM)
  - Generalized rating scale model (GRSM)
  - Generalized partial credit model (GPCM)
  - Samejima's Graded response model (SGRM, or GRM)

A free demo version is available at the Xcalibre 4.1 webpage.
Updates to Iteman 4 and FastTEST Web

Iteman 4
Iteman 4 is a psychometric analysis environment for not just calculating statistics, but for the publishing of detailed report documents. This summer saw the addition of differential item functioning (DIF), delimited input (e.g., CSV), and meaningful domain labels to facilitate reporting. Download the free version here.

FastTEST Web
This summer saw the release of a customizable Item Review Module. Users can create fields for which they need reviewer input. For example, users can vote on if an item is OK to publish, rate difficulty, or vote on Bloom’s taxonomy rating. However, it is most useful for cutscore studies, such as the modified-Angoff study, where each review provides an estimated proportion-correct. Visit www.fasttestweb.com to see the system; more details are described in the August 2011 FTW Newsletter.

Interested in how Iteman 4 or FastTEST Web can make your organization more efficient? Please contact solutions@assess.com

Why are practice tests important?
Practice tests are often an essential step in learning. They provide two substantial benefits: feedback and experience.

By obtaining detailed feedback regarding their performance on the practice exam, examinees are much more able to better focus learning. Similar to formative assessment uses, a practice test can help identify gaps or weaknesses in examinee knowledge, directing further instruction. This is not only beneficial for the individual examinee, but also can translate to real increases in the population; for example, an increased pass rate on a certification exam, meaning more people in the field with recognized qualifications.

Additionally, practice exams provide a way to experience various aspects of the real exam in a controlled, lower-stakes environment. While the fidelity and quality of practice exams are quite variable – “homemade” exams can be quite poor – professional test delivery systems and psychometricians (both of which ASC can provide) can make test quality as high as possible.

Publishing Practice Tests with FastTEST Web
ASC Releases first of its own practice tests:
Four main sections of CAT-ASVAB

Practice tests and CAT
Practice exams are especially useful for an adaptive (CAT) test because of the experience. But most “CAT” practice tests are not true adaptive tests based on IRT, because most organizations do not have the expertise. However, it is now much easier to publish a true CAT practice exam.

Publish YOUR practice tests
Does your organization deliver CAT exams, and need a practice test system capable of CAT? Or simply a cost-effective platform for providing practice tests? ASC’s FastTEST Web system (www.fasttestweb.com) allows organizations to easily develop exams and delivery them via the internet.

Have an idea for a practice test, but no delivery platform or website? We have reserved www.online-practice-exams.com as a space to market future practice exams delivered with FastTEST Web.

ASC’s CAT-ASVAB
ASC has developed practice exams for the United States Armed Services Vocational Aptitude Battery (ASVAB); visit www.cat-asvab.com to learn more. These tests provide an example of both ASC’s test development capabilities and the powerful functionality available in FastTEST Web to drive the process.

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A new version of Lertap, 5.9.2, is ready for users of Excel 2010, the most recent Windows version of Microsoft's spreadsheet program. The previous version of Lertap for Excel 2010 worked only with 32-bit systems. Lertap 5.9.2 works with both 32- and 64-bit systems.

There are other changes in this new Lertap. Several of the reports have been revised. For example, Stats1b reports now use special highlighting to make it more obvious when item distractors seem to be misbehaving. And the item difficulty-by-discrimination scatterplot featured at the end of Stats1b reports now includes new labeling on the difficulty axis, making it more apparent where lie the easy items, and where lie the hard ones. Item response graphs, such as Lertap’s quintile plots, have new coloring schemes, and have been resized as to be more amenable to printing.

A special option in this new version makes it possible to produce data matrix and item control files ready for immediate input to ASC’s Xcalibre 4 flagship IRT program. A free, fully-functional 30-day version of Lertap 5.9.2 for Excel 2010 may be downloaded here.

**New website**

A new website is now available for all users (not just those with Excel 2010). It has several sample datasets which may be downloaded, ready to use with Lertap. Each dataset has unique characteristics meant to exemplify the application of Lertap to particular situations. They include cognitive tests, and affective scales. One of the affective scales lends itself to Lertap’s principal components analysis. One of the datasets shows how to create Lertap control lines which will breakout the performance of trial test items; another for test-retest and split-half reliability.

Examples are given which demonstrate how to export results from Lertap to other programs, such as Xcalibre and SPSS. Lertap also makes it easy to export results for use with Bilog MG.

The matter of printing Lertap results is also addressed in the website. Excel has good, flexible printing capabilities; how to apply them with Lertap output is given special mention.


**Other Lertap links**

The main website at Curtin University in Western Australia:


The on-line help system:


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**Q&A Tips in Psychometrics**

**Q:** What do I need to implement computerized adaptive testing (CAT)?

**A:** Moving a test to a CAT format is not a decision to be made lightly. While the benefits of CAT are numerous and well-known, CAT requires substantial investment to implement. Nevertheless, CAT is often more cost-effective in the long run due to its high efficiency and other benefits. Unfortunately, many people have only a vague notion of what CAT is, and no notion of its requirements.

How do you know if CAT is applicable for your organization? Here are some basic requirements for CAT implementation:

- Large sample sizes (depending on IRT model, minimums of 100-1,000)
- Items objectively scored in real time
- Resources to develop large item banks
- Item banker that stores IRT parameters
- Test delivery platform capable of real CAT; [www.fastestweb.com](http://www.fastestweb.com) is the only open-content system available
- PhD psychometrician knowledgeable in IRT and CAT simulation research

ASC can provide the latter three; you must provide the first three.
Student Grants

Graduate students are eligible for grants to cover the cost of ASC software. If you are a graduate student, please visit the APM Student Grant webpage.

Upcoming Events

• **Council on Licensure, Enforcement, and Regulation (CLEAR)**
  
  *September 8-10, Pittsburgh, PA*
  
  We will be exhibiting in Booth #32.

• **National College Testing Association**
  
  *September 21-24, San Diego, CA*
  
  Visit us in the Exhibit Hall!

• **International Association for Computerized Adaptive Testing**
  
  *October 3-5, Monterey, CA*
  
  No exhibit booths; ASC staff will be making several research presentations.

• **Council on Licensure, Enforcement, and Regulation (CLEAR)**
  
  *November 8-11, New Orleans, LA*
  
  We will be exhibiting in Booth #32.

• **ASC Workshop on IRT/CAT**
  
  *January 23-25, University of Brasilia, Brazil*
  
  This workshop provides training on IRT/CAT theory and applications.

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