Introducing the Gain Report

Released in May 2011 as part of the Literacy and Numeracy for Adults Assessment tool, the **Gain Report** identifies learners who have made a statistically significant improvement in their assessment results.

Key points

The Gain Report allows organisations to see which learners have made a statistically significant learning gain between two assessments.

Statistically significant gain means that the Assessment Tool is confident the difference between two scale scores represents real learning progress and cannot be explained as resulting from the imprecision associated with the assessment scores.

A statistically significant gain isn't necessarily a large gain. It merely indicates that the Assessment Tool is confident that the gain is greater than zero. Making a learning gain takes time, explicit acts of teaching and learner engagement.

How do I access the Gain Report?

The Gain Report is accessed from the Learners tab when logged into the Assessment Tool as an educator or organisation administrator. All other reports will continue to be available for educators and organisation administrators.

How is the Gain Report generated and presented?

Generating a Gain Report allows an organisation administrator or educator to select the assessment area (e.g. numeracy), learners and date range for analysis. The Assessment Tool then finds the earliest and latest assessment results within the date range for each learner and calculates the difference between the scale scores (the gain score), and the measurement error associated with the gain score. It also determines whether the gain shown for each learner is statistically significant. This shown by an asterisk next to the gain scores that are statically significant.

The Gain Report is presented using a table and a graph[1]. The table shows the selected learners and their assessment results, and the graph uses box plots to represent the spread of initial and final scores[2]. Summary information for the group of learners is also provided. This includes the average gain, the average time that has elapsed between assessments and the proportion of learners whose gain score is statistically significant. Educators can use links embedded in the report to view the Individual Learner Report for any of the assessment results shown.
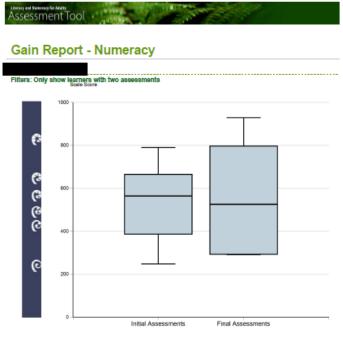
What is a gain score?

When we compare two assessment scores for a learner we refer to the difference between them as the gain score.

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[1] The graph is not displayed when the number of learners with two scores (an initial and final) is less than 10.

2 Similar boxplots can be produced across selected assessments for an existing group using the Group Progress Report. The Gain Report is different in that it allows you to make up a group of learners "on the fly" and then automatically locates their earliest and latest assessment results within a selected time period.

Image of a Gain Report showing box plot graph and list of learner results

Gain Report - Numeracy

Filters: Only show learners with two assessments

Achievement Statistics

	Initial Assessments	Final Assessments
No. of Learners	10	10
Maximum	790	929
Upper Quartile	667	798.5
Median	564.5	525.5
Average	537	555.8
Lower Quartile	384.5	291
Minimum	248	291

Scores recorded between May 12 2010 and May 12 2011

Name	Date 1	Score 1	Error (+/-)	Date 2	Score 2	Error (+/-)	Elapsed Time	Gain	Gain Score Error (+/-)
	Jul 30 2010	712	28	Apr 18 2011	291	142	37.4 weeks	-421	145
	Jun 18 2010	486	27	Apr 18 2011	291	142	43.4 weeks	-195	145
	Jan 13 2011	614	56	Apr 18 2011	291	142	13.6 weeks	-323	153
	Jul 09 2010	549	29	Sep 22 2010	514	28	10.7 weeks	-35	40
	Jul 13 2010	396	28	May 12 2011	795	59	43.3 weeks	399*	65
	Aug 03 2010	373	29	Sep 20 2010	337	28	6.9 weeks	-36	40
	Sep 20 2010	790	30	May 12 2011	929	57	33.4 weeks	139*	64
	Jan 18 2011	622	39	May 12 2011	771	41	16.3 weeks	149*	57
	Jan 18 2011	580	38	May 12 2011	802	48	16.3 weeks	222*	61
	Sep 08 2010	248	73	Jan 18 2011	537	45	18.9 weeks	289*	86

*Indicates that the observed gain is statistically significant.

Report Statistics

Average Gain	18.8
Average Time Elapsed	24 weeks
Proportion of learners making significant gain	5 out of 10

What is a gain score error?

Scale scores for assessments are never precise - they are best understood as a range, within which we can be reasonably confident the learner's true level of achievement lies. The Assessment Tool provides an indication of the precision of a scale score by reporting it within a plus or minus range, for instance, 545 ± 30. The plus or minus range is referred to as the measurement error. Whenever the tool reports a final result for instance, it always provides a 68% margin of error. This means that there is a 68% probability that the learner's true score lies in the range reported. This means we can be reasonably confident that the learner's true achievement level lies between 515 and 575.

Gain scores are best understood like this too. Because they are based on two imprecise scores they estimate how much change has occurred between the two assessments, rather than pinpoint it precisely.

When the Assessment Tool calculates a gain score it uses the measurement error associated with each of the assessment results to estimate the error associated with the gain score. Like measurement error, the gain score error is reported as a plus or minus range within which we can be reasonably sure the true gain score lies. For instance, one example in the above table shows the difference between two assessment scores (the gain score) is 149 and the error associated with this difference (the gain score error) is 57 This is indicating that we are reasonably sure (there is a 69% chance) that the true gain made is somewhere between 92 and 206.

When is a gain score statistically significant?

The Assessment Tool reports that a gain score is statistically significant when there is at least a 95% probability that the true gain is greater than zero. In other words, it is very likely that the learner's true achievement level has increased. In the above example the Assessment Tool would determine that the gain score was statistically significant.

When can I use the Gain Report?

The Gain Report will be very useful when looking at the impact of a programme of learning. It provides an overall picture of how much change the Assessment Tool is able to register between assessments. When a large number of learners are able to show a statistically significant change it is fair to conclude that the evidence points to meaningful progress for learners in the course.

What factors will impact on the size of the gain?

Making a learning gain often takes considerable time. It is much more difficult for learners to make significant change when they have had little time between assessments. Making a learning gain also depends on a range of issues including the learner's skills and motivations and their engagement in a programme of learning that involves multiple opportunities and time to learn and practise new skills. It is important to consider the time that has elapsed between assessments when considering the gain made.

Is statistically significant gain enough gain?

A statistically significant gain isn't necessarily a large gain. It merely indicates that the Assessment Tool is confident that the gain is greater than zero. How much learning gain is expected will vary depending on the length, focus and intensity of the programme and the skills and level of engagement of the learners.