

Interpreting Moodle Statistics

Moodle Statistics offer a variety of test/quiz and question bank results in text, graph and table formats.

Accessing Statistics: There are two ways to open statistics.

First way:

- **Login to Moodle**
- **Locate and Open the course**
- In Administration>Course Administration, **click Grades**
- **Scroll through the gradebook** until you reach the item you wish to view stats on, **Click on the item's title.**
- In Administration> Results, **click Statistics.** This report gives a statistical analysis of the quiz, and the questions within it.

Second way:

- **Login to Moodle**
- **Locate and Open the course**
- **Turn Editing on**
- On the Course Page, **scroll down and locate the name of the item you wish to review.** Then, **Click Edit>Edit Settings to the right of that item.**
- In Administration>Course Administration, **click Results>Statistics**

The top section of this report gives a summary of the whole quiz/test.

Quiz name	Math Online Homework C
Course name	Child & Adolescent Health (NUR 153)
Open the quiz	Tuesday, 24 May 2016, 3:00 PM
Number of complete graded first attempts	28
Total number of complete graded attempts	43
Average grade of first attempts	91.48%
Average grade of all attempts	93.90%
Average grade of last attempts	94.90%
Average grade of highest graded attempts	95.01%
Median grade (for first attempts)	92.80%
Standard deviation (for first attempts)	8.99%
Score distribution skewness (for first attempts)	-2.5129
Score distribution kurtosis (for first attempts)	9.1530
Coefficient of internal consistency (for first attempts)	84.44%
Error ratio (for first attempts)	39.44%
Standard error (for first attempts)	3.55%

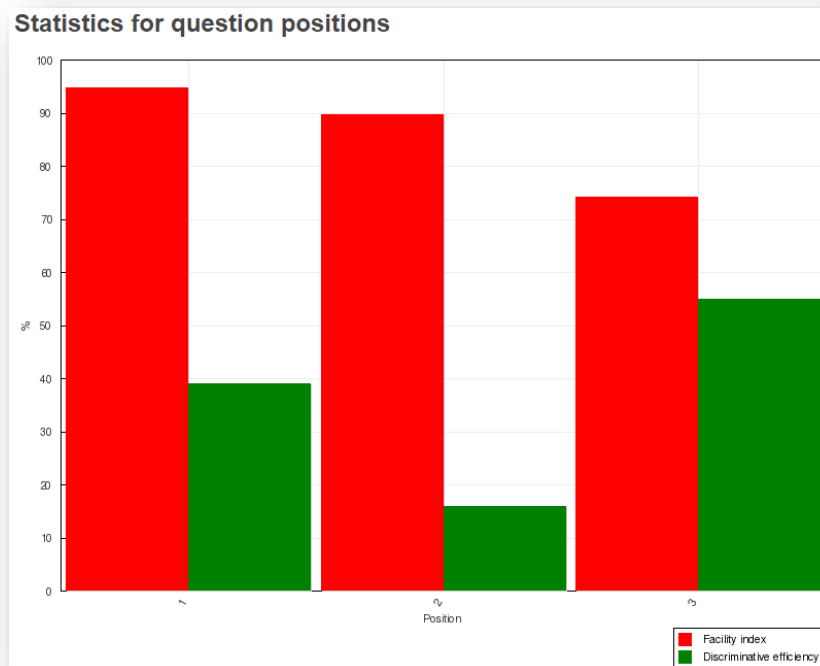
The next section gives an analysis showing all questions in a table format. There are links in this section to edit individual questions or drill down into a detailed analysis of a particular question.

Quiz structure analysis

Download table data as [Download](#)

Q#	Question name	Attempts	Facility index	Standard deviation	Random guess score	Intended weight	Effective weight	Discrimination index	Discriminative efficiency
1	Cirrhosis	58	94.83%	22.34%	25.00%	33.33%	25.42%	25.76%	38.95%
2	amiodarone Oct 7	58	89.66%	30.72%	25.00%	33.33%	29.75%	11.43%	15.94%
3	Assessing Cranial Nerve III	58	74.14%	44.17%	25.00%	33.33%	44.82%	39.94%	55.04%

The last section is a bar graph of the percent of correct answers (Facility index) and the Discriminative efficiency index.



Moodle Statistics Defined

Quiz Statistics

The Quiz Statistics information refers to the statistical overview of given tests.

Average grade: A measure of the accumulated total grade scores divided by the total number of students.

First, consider the purpose of the test. Is it early in the semester or later?

For the earlier test, you are aiming for an average score of 90% or more. This is typically a review, recall or introduction type test that should engage the students and define what they know. For tests thereafter, you should be aiming for 75% or higher on deferred feedback tests. Note: Interactive tests with multiple tries invariably lead to higher averages.

Median grade: Half the students score less than this figure.

Standard deviation: A measure of the range of responses around the **mean** score.

If all users' answers are the same, then $SD=0$. Aim for values between 12% and 18%. A smaller value suggests that scores are too bunched up.

Skewness: A measure of the asymmetry of the distribution of scores.

Zero implies a perfectly symmetrical distribution, positive values a 'tail' to the right and negative values a 'tail' to the left.

Aim for a value of -1.0. If it is too negative, it may indicate lack of discrimination between students who do better than average. Similarly, a large positive value (greater than 1.0) may indicate a lack of discrimination near the pass fail border.

Kurtosis: A measure of the sharpness of a peak of a frequency distribution curve.

A normal, bell shaped, distribution has a kurtosis=0. The greater the kurtosis, the more peaked is the distribution, without much of a tail on either side. Aim for a value in the range 0-1. A value greater than 1 may indicate that the test is not discriminating very well between very good or very bad students and those who are average.

Coefficient of Internal Consistency: (sometimes called Cronbach Alpha) This is a measure of whether all the items in the quiz are testing basically the same thing. It measures the consistency of the text, which is a lower bound for the validity.

Higher numbers here are better. It is impossible to get internal consistency much above 90%. Anything above 75% is satisfactory. If the value is below 64%, the test as a whole is unsatisfactory and remedial measures should be considered. A low value indicates either that some of the questions are not very good at discriminating between students of different ability and that the differences between total scores owe a good deal to chance or that some of the questions are testing a different quality from the rest and that these two qualities do not correlate well.

Error Ratio: The variation in the grades comes from two sources.

Source 1: The students who are better than others at what is being tested.

Source 2: Random variation.

We hope that the quiz grades will largely be determined by the student's ability, and that random variation will be minimized. The error ratio estimates how much of the variation is random, and so lower is better!

Values of ER in excess of 50% cannot be regarded as satisfactory: they imply that less than half the standard deviation is due to differences in ability and the rest to chance effects.

Standard Error: This is derived from the error ratio, and is a measure of how much random variation there is in each test grade.

So, if the Standard error is less than or equal to 10 and a student scored 60%, then their real ability probably lies somewhere between 50% and 70%. The smaller the value of SE the better, but it is difficult to get it below 5% or 6%.

Quiz Structure Analysis

The Quiz Structure Analysis lists all the questions in the quiz with various statistics in a table format.

Q#, et al: Shows the question (position), question type icon, preview and edit icons.

Question name: The name is linked to the detailed analysis of this question. Click the name to see the individual question statistics.

Attempts: Shows how many students attempted this question in the current course where it is being used.

Facility index: The mean score of students on the question.

5 or less Extremely difficult or something wrong with the question.

6 - 10 Very difficult

11 - 20 Difficult

20 - 34 Moderately difficult

35 - 64 About right for the average student

66 - 80 Fairly easy

81 - 89 Easy

90 - 94 Very easy.

95 - 100 Extremely easy

Standard Deviation: A measure of the range of responses around the mean score.

A smaller value suggests that scores are too bunched up, however, if the Facility index is very high or very low, it is impossible for the spread to be very large. A good SD does not automatically ensure good discrimination. A value of SD less than about a third of the question maximum (i.e. 33%) in the table is not generally satisfactory.

Random Guess Score: The score the student would get in a question by guessing randomly.

Intended/Effective Weight:

- Intended weight is simply what you set up when editing the quiz. If question 1 is worth 3 marks out of a total of 10 for the quiz, the intended weight is 30%.
- The effective weight is an attempt to estimate, from the results, how much of the actual variation was due to this question.

Ideally the effective weights should be close to the intended weights. If the effective weight is greater than the intended weight it shows the question has a greater share in the spread of scores than may have been intended. If it is less than the intended weight it shows that it is not having as much effect in spreading out the scores as was intended.

Discrimination Index: This is the correlation between the score for this question and the score for the whole quiz. It indicates how effective the question is at sorting out able students from those who are less able.

Higher numbers are better:

50 and above Very good discrimination

30 – 50 Adequate discrimination

20 - 29 Weak discrimination

0 - 19 Very weak discrimination

-ve Question probably invalid

Why are some questions highlighted in red?

They are questions where the Discrimination index is low. That is a bad sign. It means that many students who score a high overall grade got a bad score for this question, and vice versa. It suggests you should check that question, to make sure it does not contain an error.

Discriminative Efficiency: This statistic attempts to estimate how good the discrimination index is relative to the difficulty of the question.

The discrimination efficiency will very rarely approach 100%, but values in excess of 50% should be achievable. Lower values indicate that the question is not nearly as effective at discriminating between students of different ability as it might be and therefore is not a particularly good question.

Quiz Question Statistics

In the *Quiz Structure Analysis*, click the **question name** to see the individual question statistics. It is possible to see the statistics for one question on a single page. This view will also tell you what percentage of quiz takers selected each answer (Analysis of responses) and give you basic information about the question.

Question information: The basic information about the question, the name of the quiz, the question name, the question type, the position of the question in the quiz and the question itself.

Question statistics: This repeats the information from the table row from the Quiz Structure Analysis.

Analysis of Responses: This gives a frequency analysis of the different responses given to each part of the question every time that question was used in a course.

Analysis of responses

Model response	Partial credit	Count	Frequency
To compare the growth of their child to that of other children of the same age.	0.00%	0	0.00%
To establish specific time frames for specific changes to occur in the child's behavior and development.	0.00%	8	27.59%
To gain realistic expectations of their child's behavior and ability.	100.00%	19	65.52%
To understand that at times of rapid growth, the child will also experience acceleration of development.	0.00%	1	3.45%
[No response]	0.00%	1	3.45%

Note: The details of the analysis depends on the question type, and not all question types support this. For example, essay question responses cannot be analyzed

Download Reports

You can choose whether to run the report on all attempts or for select students. I recommend changing the download table data to *Excel Spreadsheet* before clicking the blue **Download** button. Once the spreadsheet is downloaded, you may open it, then hide or delete any columns you wish.

Making Edits

If you find that edits need to be made to correct a question or its answer, you can click the edit wheel under the question in Quiz Structure Analysis.

Question name, Question, Answer Choices, Point values and Feedback edits will automatically update the details of the question.

HOWEVER, in an activity that contains these questions, the original score awarded to a student would not change (unless you additionally clicked the "Regrade" button after the question bank update.)