

1 of 1

The following list gives the market share of 6 companies:

Company A has 15%
Company B has 18%
Company C has 8%
Company D has 6%
Company E has 25%
Company F has 28%

*Random market shares and
number of companies*

The Herfindahl index is defined as $\sum_{i=1}^n s_i^2$

where s_i is the market share of company i .

*Font colours and sizes can be
chosen by the user*

The Herfindahl index is

Now suppose that companies E and C merge. What is the change in the Herfindahl index?

Input your answer here ...

Computer-aided assessment

Georgia is given a graph showing a feasible region (shown yellow) in a linear programming problem. Points on either line are feasible but non-feasible regions have been shaded out. Which of the sets of (possibly unsimplified) inequalities below represents the yellow region on the graph shown?

(Accurate) SVG graph draw at runtime (NOT a graphic and will resize according to chosen font size)

In a LP question, each of the 3 possible option points is 'reverse engineered' to have integer coordinates.

Mal-rules in action here test the meaning of inequalities

- $3x + 4y \geq 20$, $7x + 4y \leq 36$, $x \geq 0$, $y \geq 0$
- $3x + 4y \leq 20$, $7x + 4y \geq 36$, $x \geq 0$, $y \geq 0$
- $3x + 4y \leq 36$, $7x + 4y \leq 36$, $x \geq 0$, $y \geq 0$
- $3x + 4y \geq 36$, $7x + 4y \geq 20$, $x \geq 0$, $y \geq 0$
- None of these!
- I don't know!

Your result

Your answer is wrong. The correct answer is 7.
To solve these equations :

$$\frac{-(8x - 28)}{7} - \frac{(3x - 17)}{2} = -6$$

You must first multiply the equation by 7×2

to give:

$$-2(8x - 28) - 7(3x - 17) = -6 \times 7 \times 2$$

Then multiply out the brackets to give $-16x + 56 - 21x + 119 = -84$

Collect all terms involving x on one side and all other terms on the other side of the equation as follows:

$$37x = 259$$

and divide through by 37

to find x.

Related material - Microsoft Internet Explorer

Norton™ Fraud monitoring is on Options ▾

If you want to find out more about this topic, you can look at one or more of the following resources (the most specific are listed first):

- <http://www.mathcentre.ac.uk/students.php/mathematics/algebra/linearequations/resources/>
- <http://www.pplato.co.uk/PPLATOResources/interactive%20mathematics/equations.pdf>
- mms://stream.ncl.ac.uk/w.h.foster/Robin/3.1/RSJ_solve_linear_equation.wmv
- <http://www.pplato.co.uk/PPLATOResources/maths%20for%20science/mathsforscience.pdf>
- <http://www.mathtutor.ac.uk/algebra/Main.html>
- a GCSE book at Intermediate level for additional information about this topic.

Close

Related material button triggers additional web links

Randoms carried through to the feedback

Feedback

Related material

0 out of 2

Economics applications\Theory of the firm\Supply and demand\Linear relations

1 of 1

The demand and supply functions (in \$) of a good are given by:

$$P = -8Q_D + 400$$

$$P = 10Q_S + 94$$

Randoms are all the numbers in the supply and demand equations and the currency chosen (\$ in this case)

Calculate the equilibrium quantity Q_{eq} and price P_{eq} .

$$Q_{eq} = \text{[input box]} \quad P_{eq} = \text{[input box]}$$

What are the new values of Q_{tax} and price P_{tax} at equilibrium if the government imposes a fixed tax of \$36 per good?

$$Q_{tax} = \text{[input box]} \quad P_{tax} = \text{[input box]}$$

Hint: Input integer values only.

At equilibrium the demand and supply curves (straight lines in this case) cross each other, giving the equilibrium point (P, Q) . At this point we have $Q_D = Q_S = Q$ (say). Since both demand and supply equations give an expression for P , we can eliminate it giving:

$$-8Q + 1000 = 4Q + 844$$

Part of the extensive feedback given; this has proven to be useful to students who spend a lot of time studying it

Solve this equation for Q , giving $Q_{eq} = 13$, and then substitute into either of the original equations to find P_{eq} .

Note: it is advisable to check that your solution then satisfies the other equation too!

The second part of the question asked for new values of P and Q at equilibrium if the government imposed a fixed tax of \$108 per good?

In this case the company making the good gets the price P paid by the customer less the tax of \$108. Hence the supply equation is now:

$$P - 108 = 4Q_S + 844$$

Adding 108 to both sides gives a new expression for the supply curve.

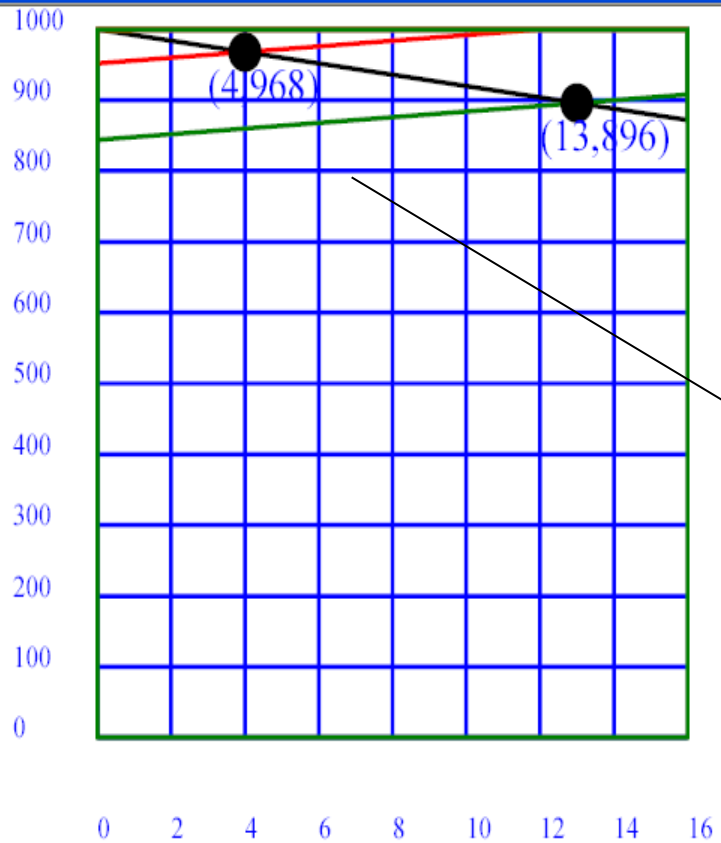
However, the demand function stays the same.

At the new equilibrium point the demand and supply curves (still straight lines) cross each other, giving the new equilibrium point (P, Q) . At this point we again have $Q_D = Q_S = Q$ (say). Since both demand and supply equations give an expression for P , we can eliminate it giving:

$$-8Q + 1000 = 4Q + 952$$

Solving for Q and then substituting into either the demand or supply expressions for P gives the new equilibrium point after tax.

Graphically the overall picture looks like



Feedback continued: SVG graph plotted according to the question randoms

where the

- BLACK line is the DEMAND curve
- GREEN line is the SUPPLY curve without TAX
- RED line is the SUPPLY curve with TAX

Notice that as a tax is applied, the equilibrium point moves up the demand curve.

Finally notice the price rise is $\$968 - \$896 = \$72$ which is the extra that is paid by the customer, so the remaining tax of $\$36$ is actually paid by the company.

ZZ Lboro talk

1 of 1

Print this screen Colours & Fonts Mathematics

In the following sentence, Cleo has used a clumsy expression. Replace it (one different word in each box provided):

We should **be OK with** this proof.

Submit

Synonyms

ZZ Lboro talk

1 of 1

Print this screen Colours & Fonts Mathematics

In the following sentence, Brian has used a clumsy expression shown in red. Choose three words that could replace it (one different word in each box provided):

We should **have another look at** this conjecture.

Submit

ZZ Lboro talk

1 of 1

In the following sentence, Jethro has made at least one error. Fully correct each word (possibly including an apostrophe or a hyphen) in the sentence and press SUBMIT.

Although it appear's to be rather pure, discrete mathematics has wide ranging applications in data cc

- Skeleton sentence with
- random number of errors
 - Look-up array of likely errors e.g. effect/affect etc

1 of 1

Using the Harvard reference style decide which of the statement(s) about the format for a book reference is/are true, if any.

If you think the statement is **true**, input **T**.

If you think the statement is **false**, input **F**.

If you think the statement is **unspecified** by the Harvard reference style, input **U**.

Statement	T, F or U ?
The author's surname should be in plain text.	<input type="text"/>
The year of publication should be in <i>italics</i> .	<input type="text"/>
The edition should be <u>underlined</u> .	<input type="text"/>
Pages should be in {curly brackets}.	<input type="text"/>

Statement =
Subject +
Property

Remember all inputs must be either T, F or U.

To gain marks on this question, you need to get every input correct.

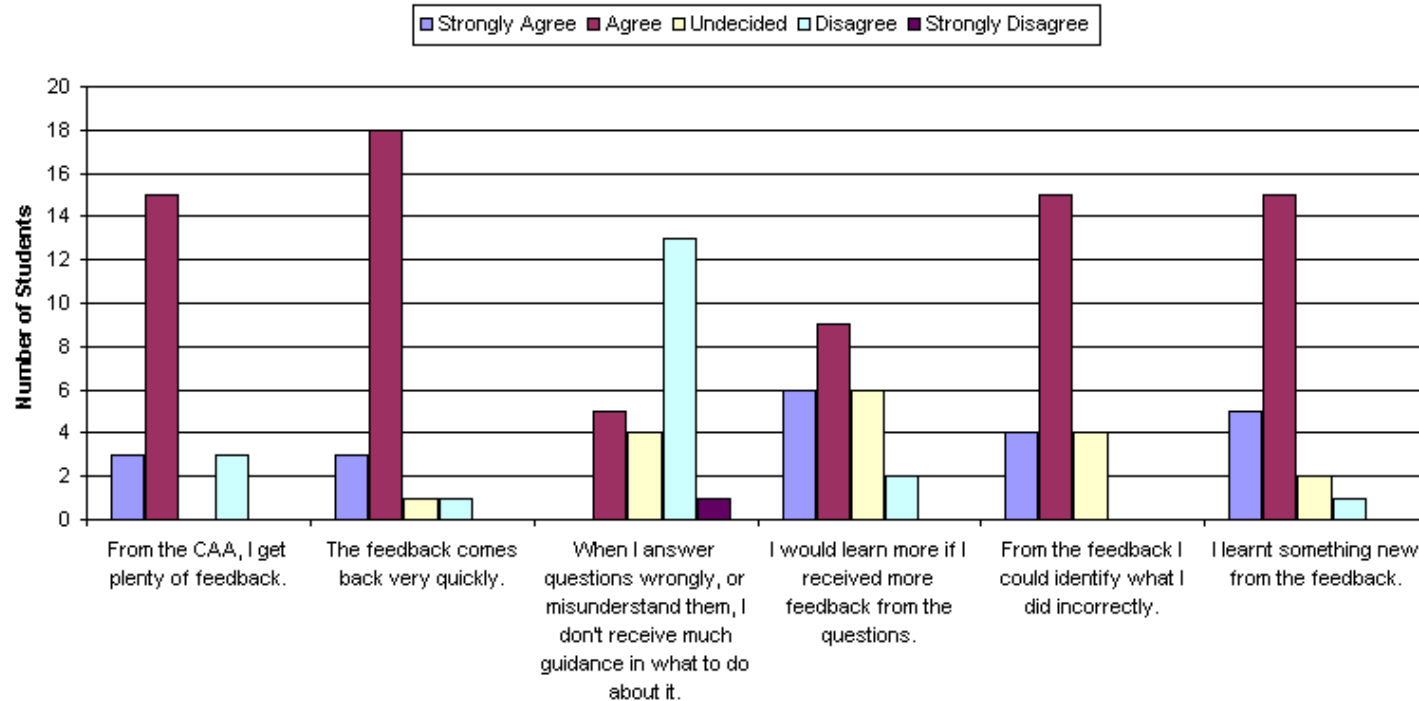
Results of trials

- Error taxonomy

Error Type	Classification
Assumption	Students assume certain things that are not true, for example, in projectile questions, that vertical velocity is equal to initial velocity.
Calculation	Method correct but calculation errors are made.
Copying	Copying values incorrectly.
Definition	Not knowing the definition of terms given in question text, e.g. magnitude.
Formulas	Incorrectly stating/recalling formulas.
Incorrect Values Used	Using incorrect values in method, for example, when substituting values into formulas.
Knowledge	Knowledge students are lacking that would enable them to answer questions.
Methodology	Students attempt to use an incorrect method to answer a question.
Modelling	Generic definition, e.g. ignoring forces, such as gravity, acting on particles.
Procedural	Method student attempts to use is correct but can only do initial/certain stages of the method. They stop halfway through when they do not know the stages that follow or when they are unable to interpret initial results.
Reading	Reading the question text incorrectly and confusing the value of variables.
Trigonometry	Basic definitions of cosine, sine and tan incorrect. This is most apparent in questions where students are required to resolve forces.

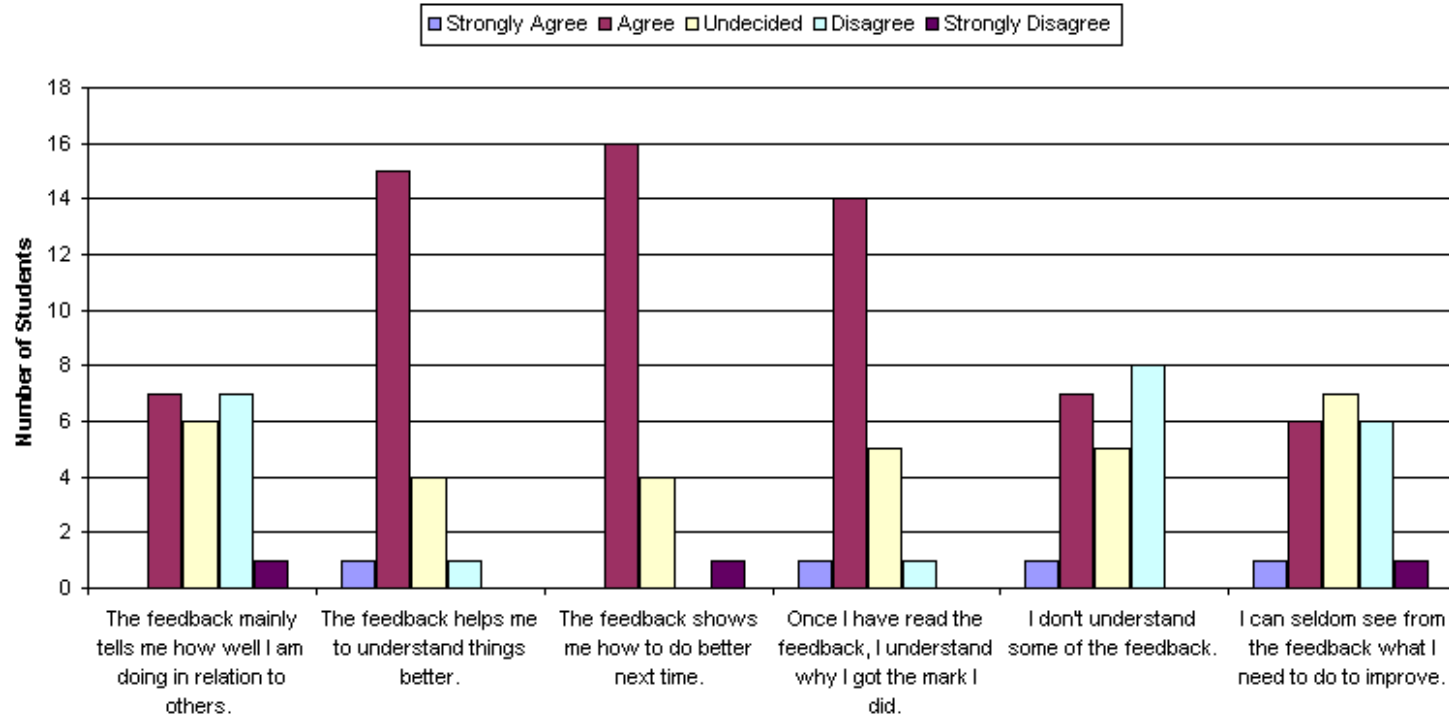
Efficacy of feedback: what do students say about it

- Quantity and timing of the feedback

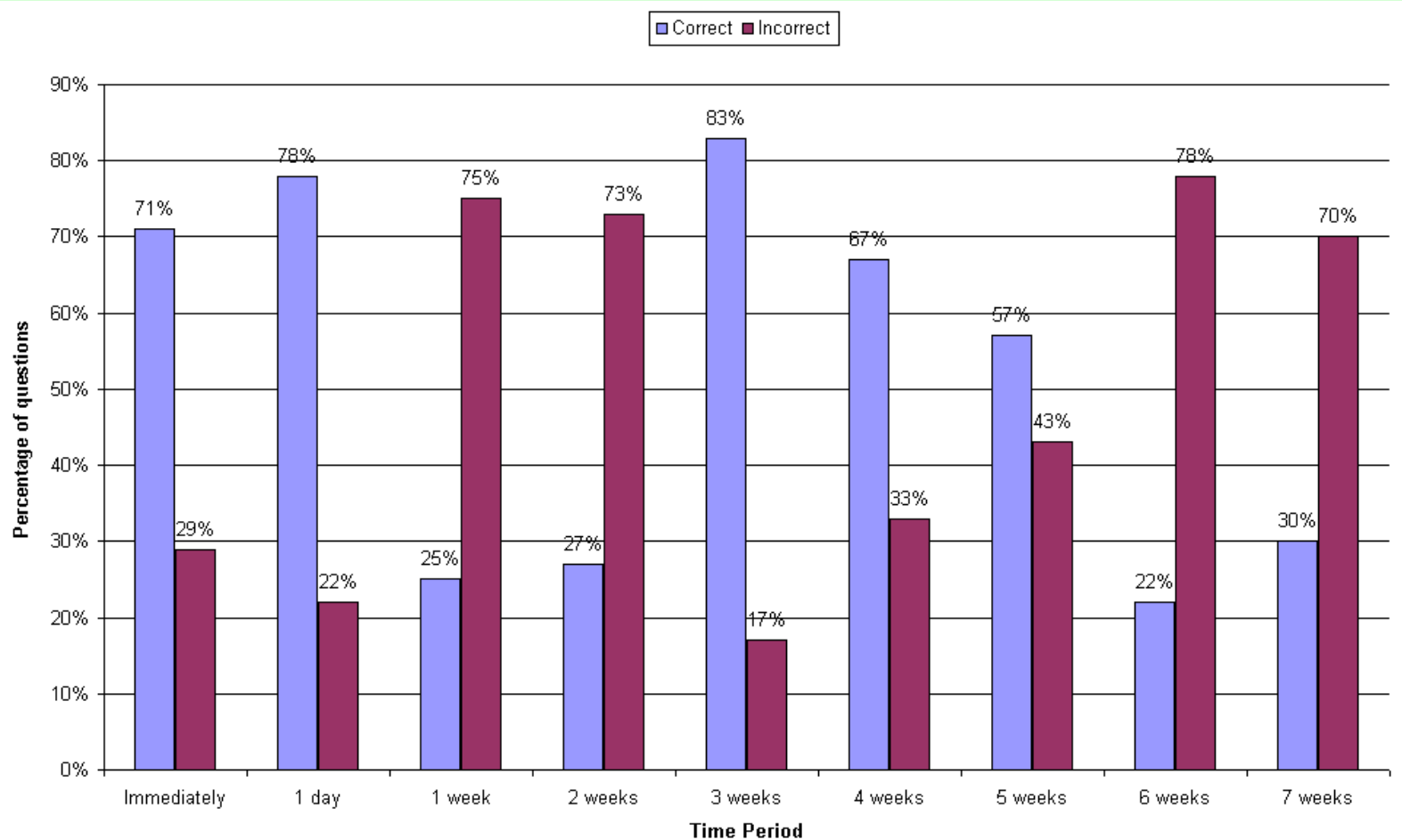


Efficacy of feedback: what do students say about it

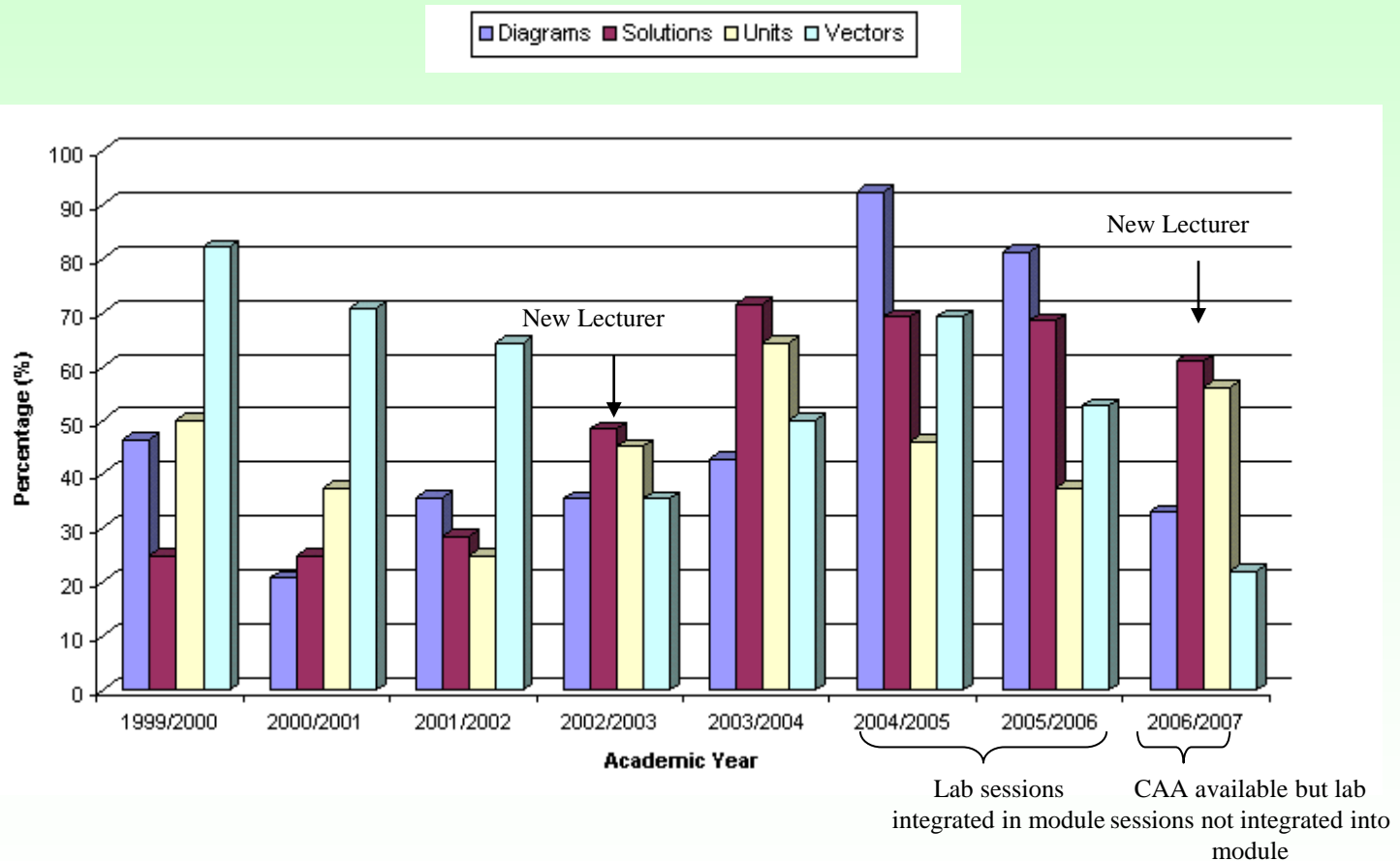
- Quality of the feedback



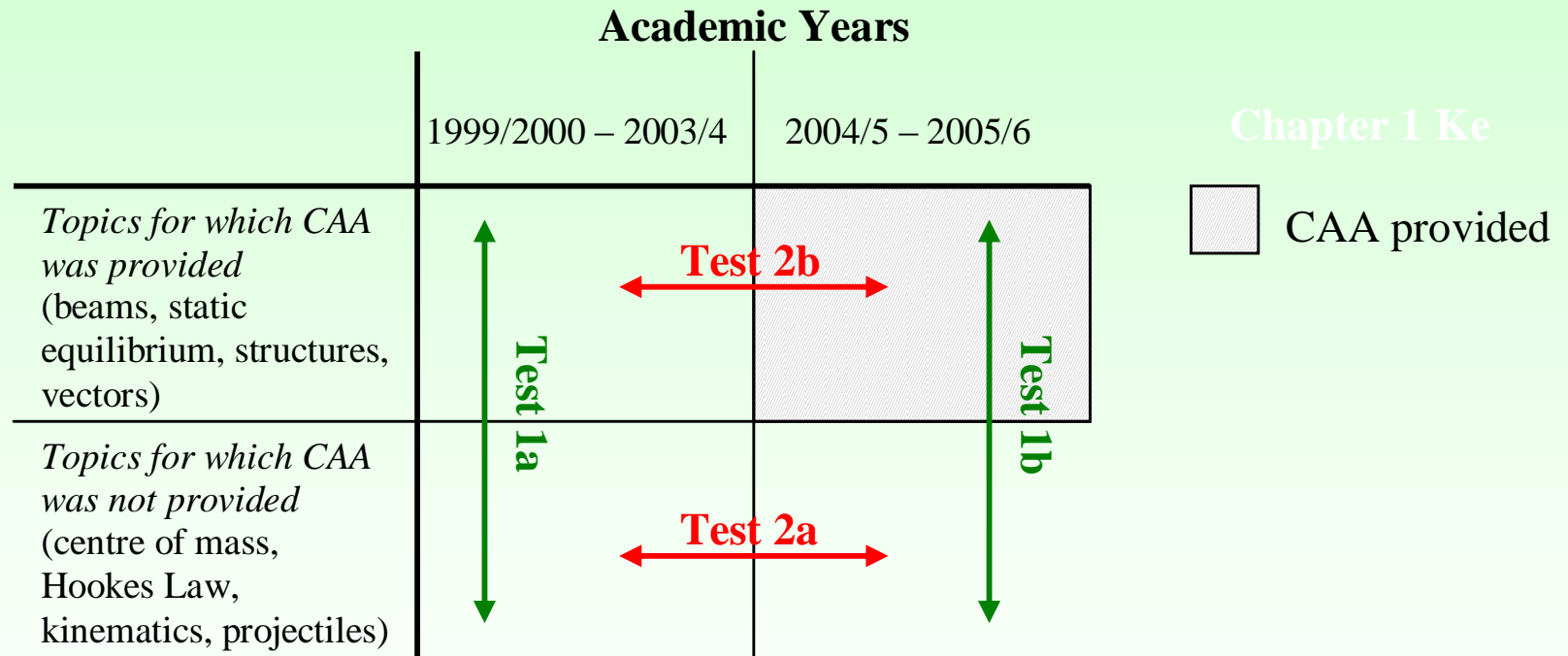
Efficacy of feedback: how long do students retain it



Efficacy of feedback: Indicators for understanding exam scripts



Efficacy of feedback: Analysis of marks



CAA Conclusions

- Mal-rules apply in other areas of maths.
- Error taxonomy applies in other areas of maths.
- CAA is a popular resource to use.
- CAA is effective, if skills are tested and full feedback is given.
- CAA can be effectively applied beyond mathematics.

Summing up

- **We received very positive feedback from students, they found the support and help useful and sufficient. This indicates that the existed mathematics support service and developed CAA meet the needs of the students and should be run in the future.**