

# SCHOLAR

Prògram Oilthigh Heriot-Watt



## The SCHOLAR Programme: Impact on Learning

Professor Phillip John  
Senior Dean of the University  
Heriot-Watt University

Executive Chair, SCHOLAR Forum

*MathSpeak Conference 2014*

*London 5 November 2014*



## What is the role of educational technology?

*..and I don't mean the technology!*

## Does educational technology work?

*..and I don't mean the technology!!*

# SCHOLAR

A programme of Heriot-Watt University  
Prògram Oilthigh Heriot-Watt



Evaluation of Evidence-Based Practices in  
Online Learning  
A Meta-Analysis and Review of Online Learning Studies



## Four research questions

- How does the effectiveness of online learning compare with face to face instruction?
- Does supplementing face to face instruction with online instruction enhance learning?
- What practices are associated with more effective online learning?
- What conditions influence the effectiveness of online learning?

# SCHOLAR

A programme of Heriot-Watt University  
Prògram Oilthigh Heriot-Watt



Evaluation of Evidence-Based Practices in  
Online Learning

A Meta-Analysis and Review of Online Learning Studies



## Technology supports different models of online learning:

- **asynchronous** tools (email, discussion boards, social networking).
- **synchronous** tools approximate face-to-face classroom teaching using webcasts, chat rooms, desktop audio/video technology.
- **multiple forms** of synchronous and asynchronous online interactions as well as face-to-face teaching.

# SCHOLAR

A programme of Heriot-Watt University  
Prògram Oilthigh Heriot-Watt



Evaluation of Evidence-Based Practices in  
Online Learning  
A Meta-Analysis and Review of Online Learning Studies



## Conclusions

“In recent studies contrasting blends of online and face-to-face instruction with conventional face-to-face classes ...

**blended instruction has been more effective**

... providing a rationale for the effort required to design and implement blended approaches.”

# SCHOLAR

A programme of Heriot-Watt University  
Prògram Oilthigh Heriot-Watt



Evaluation of Evidence-Based Practices in  
Online Learning  
A Meta-Analysis and Review of Online Learning Studies



**Have we forgotten about the  
quality of learning experiences and  
outcomes?**

- asynchronous learning leads to  
self reflection

*and thus is*

- conducive to deeper understanding

## The SCHOLAR Forum in Scotland

.....a legal partnership between HWU and ADES

- all 32 Education Authorities
- > 400 Scottish secondary schools
- 27 SCIS schools
- 5 FE Colleges
- ~ 100,000 enrolments
- Extensive staff development & pupil induction
- Content expansion (>£1m in 2013/16): 3 portfolios
- Development plan for CfE H & AH and National 5 Maths
- Evaluation (2012) carried out by Education Scotland



# SCHOLAR

A programme of Heriot-Watt University  
Prògram Oilthigh Heriot-Watt

## STEM subjects

Biology	✓	✓	✓	
Chemistry	✓	✓	✓	
Computing	✓	✓		
Human Biology		✓	✓	
Information Systems	✓	✓		
Maths	✓	✓		✓
Physics	✓	✓	✓	

## Available subjects

- Advanced Higher
- Higher
- Revised Higher
- Intermediate 1/2

# SCHOLAR

A programme of Heriot-Watt University  
Prògram Oilthigh Heriot-Watt

## Languages

ESOL (English for Speakers of Other Languages)		✓		
French	✓	✓		
Gaelic		✓		
German	✓	✓		
Mandarin				✓
Spanish	✓	✓		

## Business subjects

Accounting	✓	✓		
Art & Design (Textiles)		✓		
Business Management	✓	✓		
Economics	✓	✓		
Psychology		✓		

## Available subjects

- Advanced Higher
- Higher
- Revised Higher
- Intermediate 1/2

# SCHOLAR

A programme of Heriot-Watt University  
Prògram Oilthigh Heriot-Watt

SCHOLAR - Welcome - Windows Internet Explorer

http://courses.scholar.hw.ac.uk/vle/scholar/session.controller?action=home

File Edit View Favorites Tools Help

★ Favorites SCHOLAR - Welcome

Page Safety Tools ?

**My SCHOLAR** Advanced Search Search the site Text Size: A A A

**Tools**  
My SCHOLAR  
Reports  
Revision Planner

**Revision Today**  
None

**Resources**  
Session Summary  
Study with SCHOLAR  
Technical Requirements  
Special Character Bar

**SCHOLAR Links**  
Be safe on the internet

**Welcome Super User**

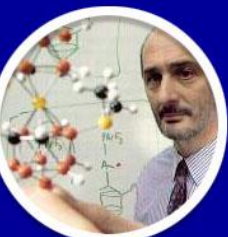
You last worked on [Intermediate 2 Mathematics](#) on 24 Feb 2012 11:57

For the latest news please check out our new [Public site](#).

You are currently enrolled on the following courses:

	Tutor Resources	Discussion	FAQ
<a href="#">An Introduction to Simplified Mandarin</a>			
<a href="#">Level 3 Geography, Geology and Environmental Science</a>			
<a href="#">Intermediate 1 Mathematics</a>			
<a href="#">Intermediate 1 Mathematics (PREVIEW)</a>			
<a href="#">Intermediate 2 Mathematics</a>			
<a href="#">Intermediate 2 Mathematics (PREVIEW)</a>			
<a href="#">Intermediate 2 Mandarin</a>			
<a href="#">Intermediate 2 Mandarin (PREVIEW)</a>			
<a href="#">Higher Accounting</a>			
<a href="#">Higher Accounting (PREVIEW)</a>			
<a href="#">Higher Art and Design (Fashion/Textile Design)</a>			
<a href="#">Higher Art and Design (Fashion/Textile Design) (PREVIEW)</a>			
<a href="#">Higher Biology</a>			
<a href="#">Higher Biology (Revised)</a>			
<a href="#">Higher Biology (PREVIEW)</a>			
<a href="#">Higher Business Management</a>			
<a href="#">Higher Business Management (PREVIEW)</a>			
<a href="#">Higher Chemistry</a>			
<a href="#">Higher Chemistry (Revised)</a>			
<a href="#">Higher Chemistry (Revised) (PREVIEW)</a>			
<a href="#">Higher Chemistry (PREVIEW)</a>			





Each subject is equivalent to 240 student effort hours (seh) ... at Level 5,6 or 7 within the SCQF.

- \* each Unit is divided into 'topics' equivalent to roughly 10 seh (or 1 SCQF credit)
- \* printed study guide plus on-line material
- \* interactive: simulations, animations, drag-and-drop, video clips
- \* formative assessments: end of topic, end of module and end of course
- \* recommended times per topic

# SCHOLAR

A programme of Heriot-Watt University  
Prògram Oilthigh Heriot-Watt

SCHOLAR - 2 Basic Geometric Properties - Windows Internet Explorer

http://courses.scholar.hw.ac.uk/vle/scholar/session.controller?action=viewOutline&contentGUID=2fdd22!

File Edit View Favorites Tools Help

SCHOLAR - 2 Basic Geometric Properties

2 Basic Geometric Properties

Advanced Search Search this subject go Text Size: A A A

Tools

- Home
- Reports
- Revision Planner

Additional Tools

- Discussion
- Activities

Revision Today

- None

Resources

- Tutor discussion
- Pathfinder discussion
- Study with SCHOLAR
- Technical Requirements
- SCHOLAR Accent Language Bar

SCHOLAR Links

- Be safe on the internet

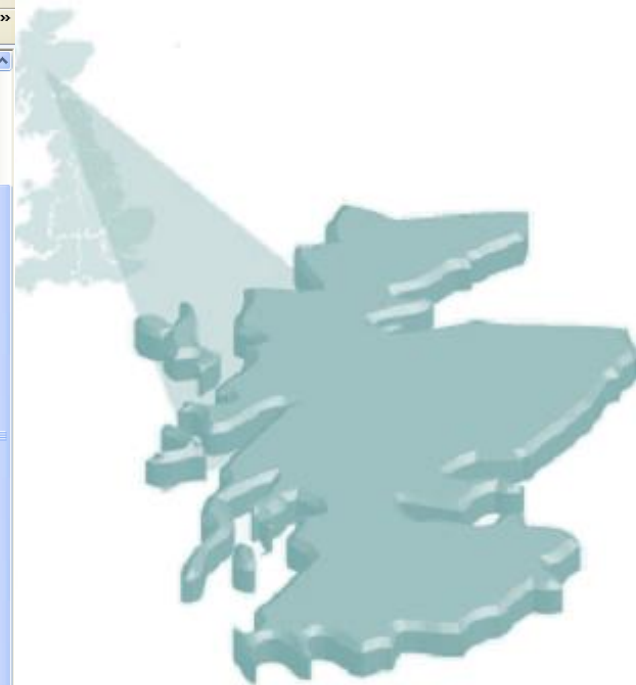
2 Basic Geometric Properties

- 2.1 Simple Composite Shapes
- 2.2 Volume of a Cube and a Cuboid
- 2.3 Area and Circumference of a Circle
  - 2.3 Area and Circumference of a Circle
    - Radius and Diameter of a Circle
    - Circumference of a Circle
    - Area of a Circle
    - Area and Circumference of a Circle Exercise
- 2.4 End of Topic Test

Glossary

Assessment	Calculation	Case Study	Discussion	Extra Help
Interactivity	Paper-based	Practical	Programming	Reading
Video	Notebook	Internet	Listening	Extra Study

start SCHOLAR - 2 Basic G... Internet 100% 02:34



## Role of the Computer in Assessment

What forms can assessment take on the computer?

**Diagnostic** --- identify strengths

**Self-test** --- give fast feedback

**Monitor** --- continuous assessment

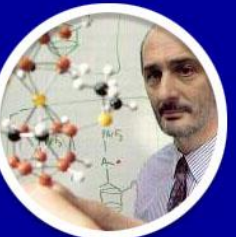
**Summative** --- grades that count for an award

How does SCHOLAR exploit this?

## Formative Assessment

- \* Inform on strengths/weaknesses
- \* Motivate --- review and consolidate
- \* Enable demonstration of knowledge, skills and understanding
- \* Prepare students for summative exams

..... *maximises performance in 'high-stakes' exams*



# SCHOLAR

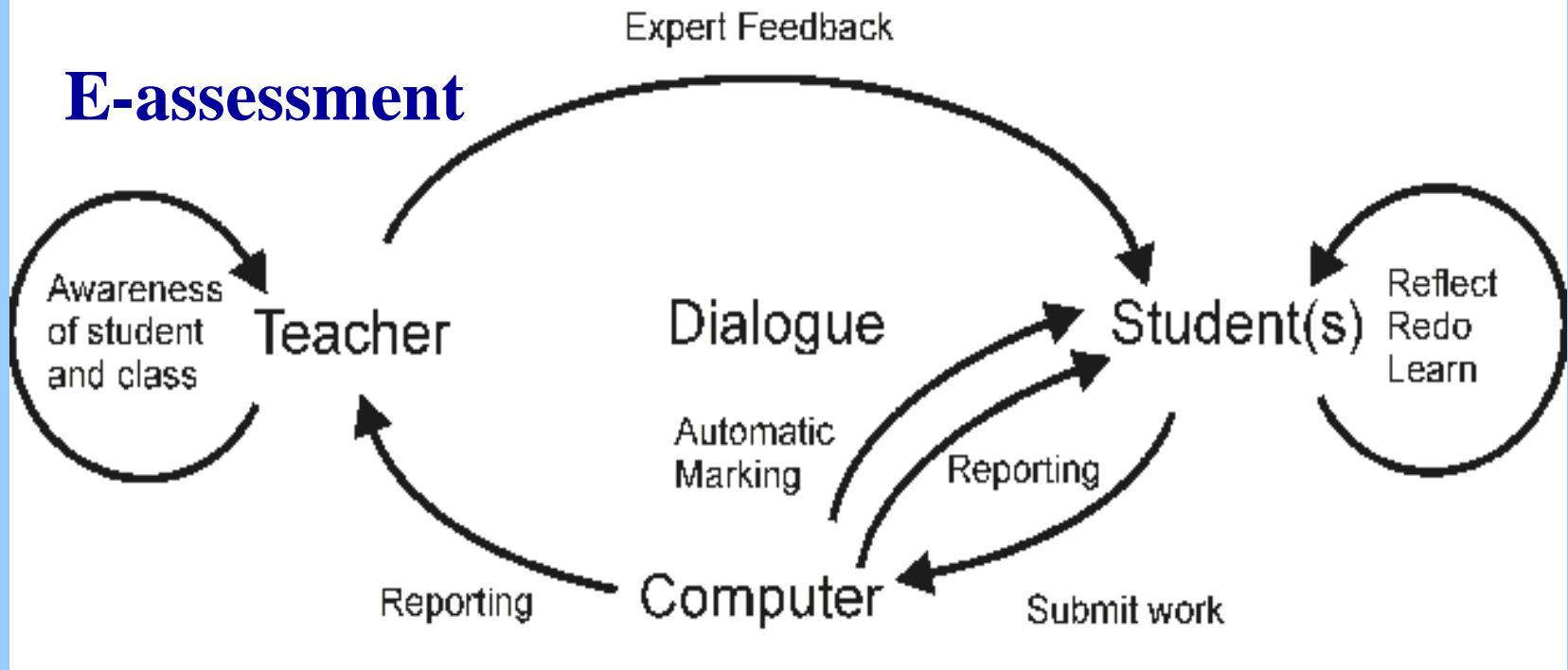
A programme of Heriot-Watt University  
Prògram Oilthigh Heriot-Watt

A screenshot of a web browser displaying the SCHOLAR website. The browser's address bar shows the URL: http://courses.scholar.hw.ac.uk/vile/scholar/session.controller?action=viewCourse&id=1. The page header includes the SCHOLAR logo and the text "A Programme of Heriot-Watt University" and "Prògram Oilthigh Heriot-Watt". The main content area is titled "Intermediate 2 Mathematics" and features a search bar with the text "Advanced Search" and "Search this course". Below the search bar, there is a list of units and topics. The left sidebar contains navigation links for "General", "Resources", "Revision Today", "Tools", and "Information". The main content area lists the following units and topics:

- Unit 1
  - 1. Calculations Involving Percentages
  - 2. Volumes of Solids
  - 3. Linear Relationships
  - 4. Algebraic Operations
  - 5. Properties of the Circle
  - 6. End of Unit 1 Test
- Unit 2
  - 1. Trigonometry
  - 2. Simultaneous Linear Equations
  - 3. Graphs, Charts and Tables
  - 4. Simple Statistics
  - 5. End of Unit 2 Test
- Unit 3
  - 1. Algebraic Operations
  - 2. Properties of Quadratic Functions
  - 3. Further Trigonometry
  - 4. End of Unit 3 Test
- Unit 4
  - 1. Calculations in a Social Context
  - 2. Logic Diagrams
  - 3. Formulae in Applications
  - 4. Statistical Assignment
  - 5. End of Unit 4 Test

“Formative assessment is tailored to the curriculum providing student and teacher with feedback at a topic, unit and course level”

## E-assessment



***Formative e-assessment is a key ingredient of success....over 30,000 items***

## Assessment and Reporting System

C:\Documents and Settings\Administrator\Desktop\i2\_mth2\_2\_Practice4.swf - Windows Internet Explorer

C:\Documents and Settings\Administrator\Desktop\i2\_mth2\_2\_Practice4.swf

File Edit View Favorites Tools Help

★ Favorites C:\Documents and Settings\Administrator\Desktop\i2...

**Practice: Using a graph to solve a system of equations (2)** ⓘ

The line  $x + 2y = 16$  is drawn on the graph.  
a) On the same graph plot the line  $x + y = 11$   
b) Use the graph to solve the system of equations  $x + 2y = 16$  and  $x + y = 11$

—●—  $x + 2y = 16$

Solution is:  $x =$    $y =$

Click on the graph to mark points for  $x + y = 11$ . Drag the points to move them. Enter the solution to the equations in the grey boxes. Press 'submit' to check your answer.

© Heriot-Watt University 2008

Done

start C:\Documents and Se...

My Computer 100% 01:17

## Assessment and Reporting System

**Q3** Outcome 2 - Simultaneous Linear Equations

The line  $x + 3y = 12$  is drawn on the graph.  
a) On the same graph, plot the line  $x + y = 8$   
b) Use the graph to solve the system of equations  $x + 3y = 12$  &  $x + y = 8$

**Feedback**  
You've plotted the equation correctly, but not entered the intersection point correctly.

Solution is:  $x =$    $y =$

Click on the graph to mark two points for the second line. You can drag the point move them. Enter the solution to the equations in the grey boxes.

[2 out of 3 marks]

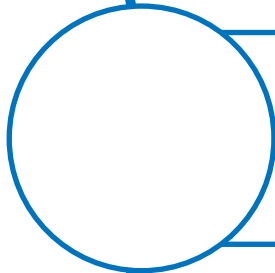
restart reveal submit

Last Name	First Name	Q1 (1)	Q2 (2)	Q3 (3)
Class	Average			
Bloggs	Jo			
Smith	Peter			
White	Jane			
Black	Anne			
Jones	Paul			
Green	Neil			
Brown	Graham			

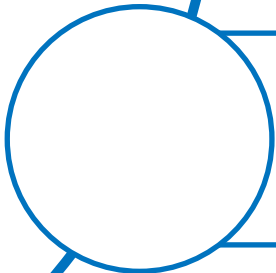
## Independent evaluation 2012



Evidence of the impact of SCHOLAR on:  
Students' use of SCHOLAR  
Attainment in specific subjects



Teachers' approaches and methods as a result of using  
SCHOLAR  
The breadth of curriculum available in schools



Views and recommendations related to the use of Glow as a  
platform for SCHOLAR – and SCHOLAR's future development

# SCHOLAR

A programme of Heriot-Watt University  
Prògram Oilthigh Heriot-Watt



## How are pupils using SCHOLAR?



# SCHOLAR

A programme of Heriot-Watt University  
Prògram Oilthigh Heriot-Watt

## Independent evaluation 2012

Over 6,000,000 'hits' – converted into sessions data



**Location**



**Timing**

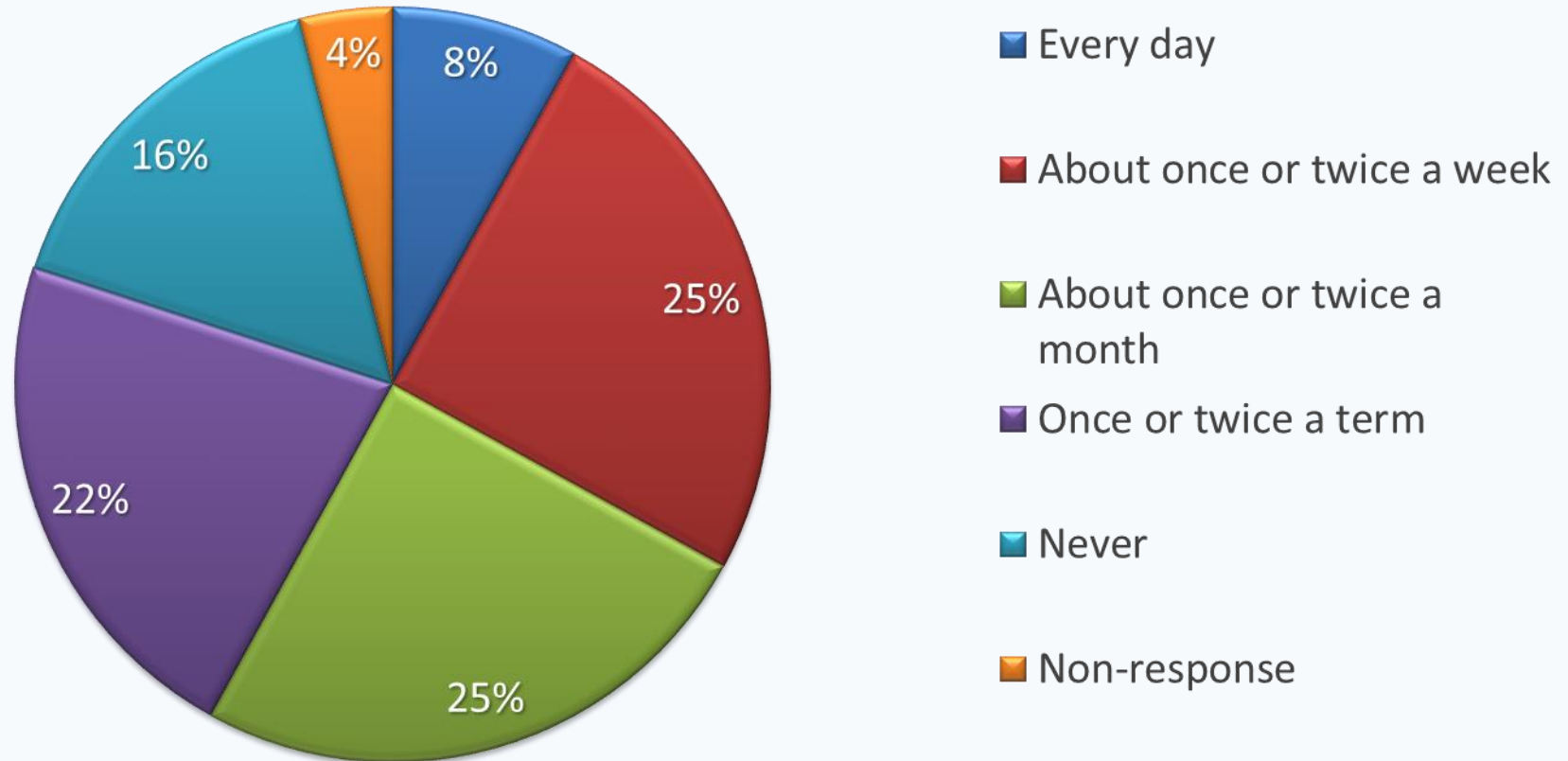


**Intensity**



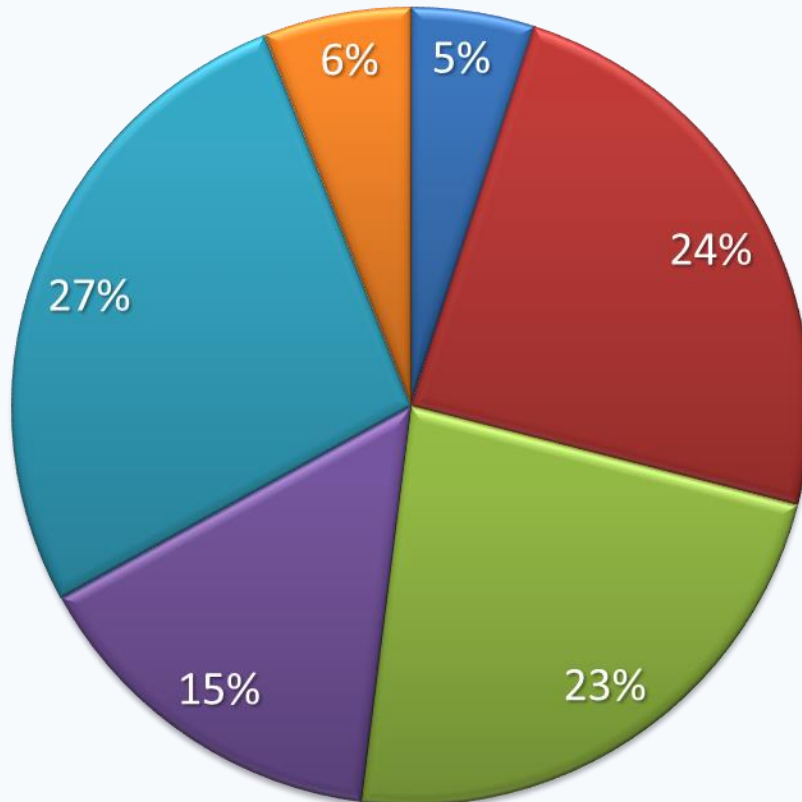
# SCHOLAR Evaluation 2012

I use SCHOLAR in class with a teacher present



# SCHOLAR Evaluation 2012

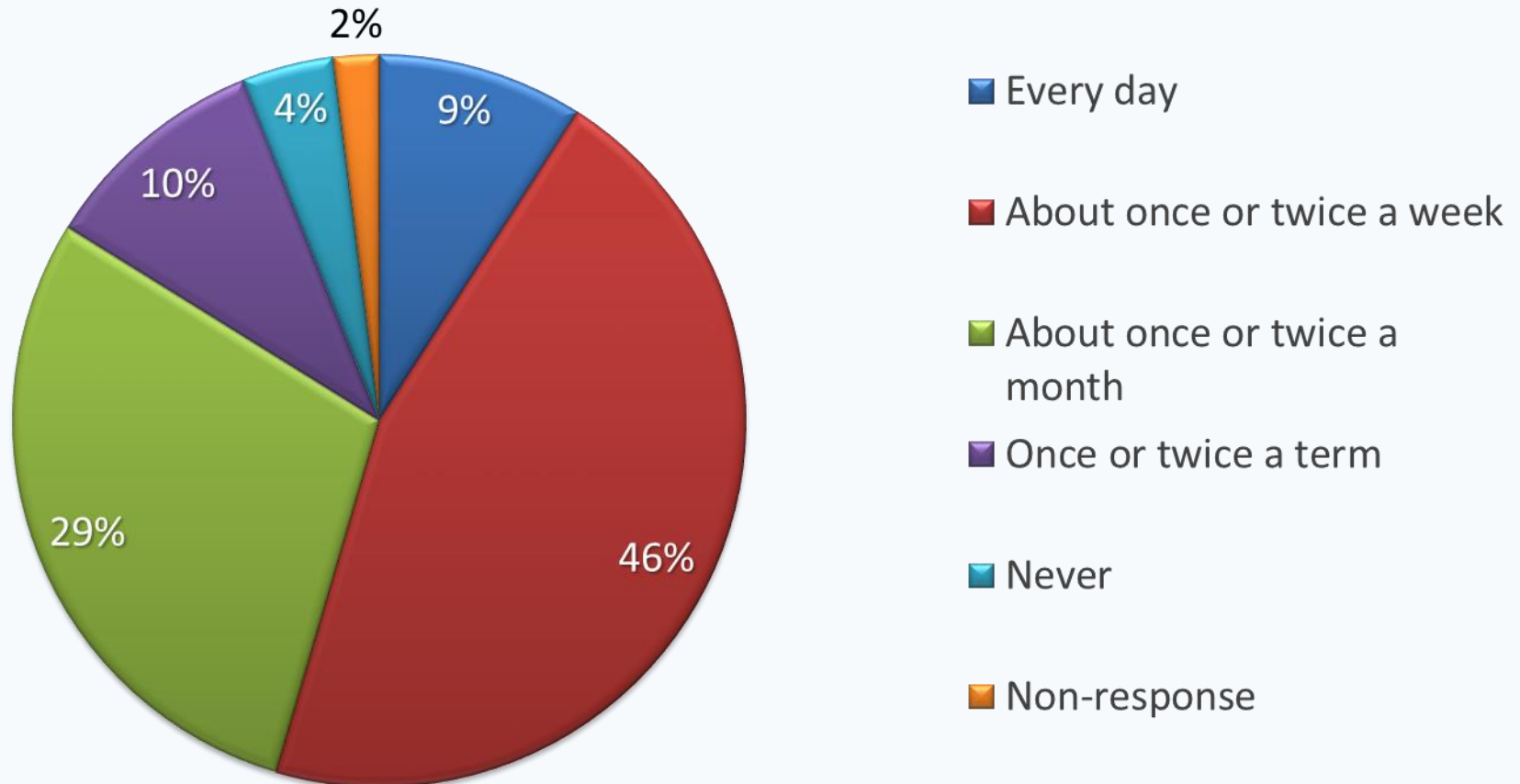
I use SCHOLAR on my own in school



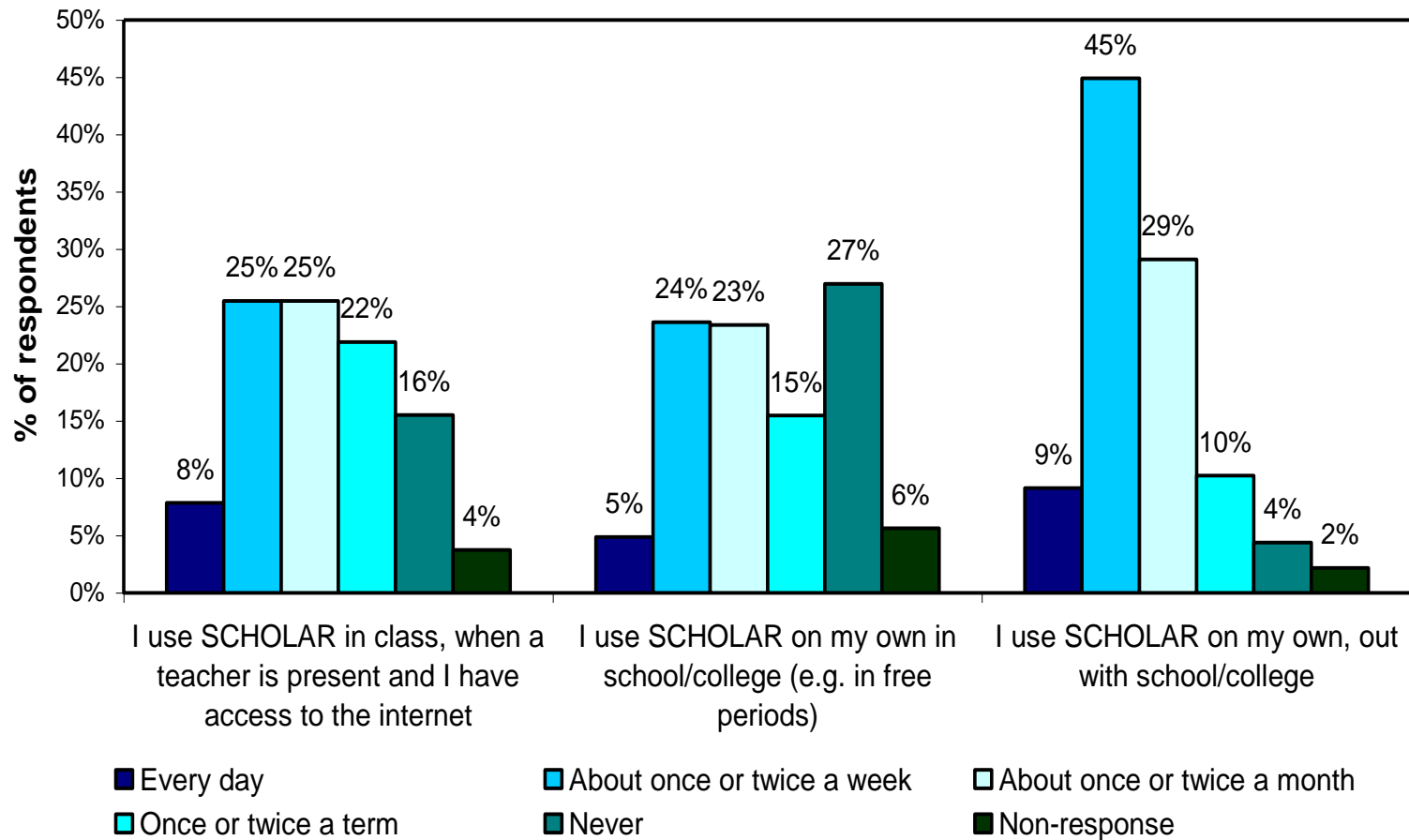
- Every day
- About once or twice a week
- About once or twice a month
- Once or twice a term
- Never
- Non-response

# SCHOLAR Evaluation 2012

I use SCHOLAR on my own at home



## Independent evaluation 2012

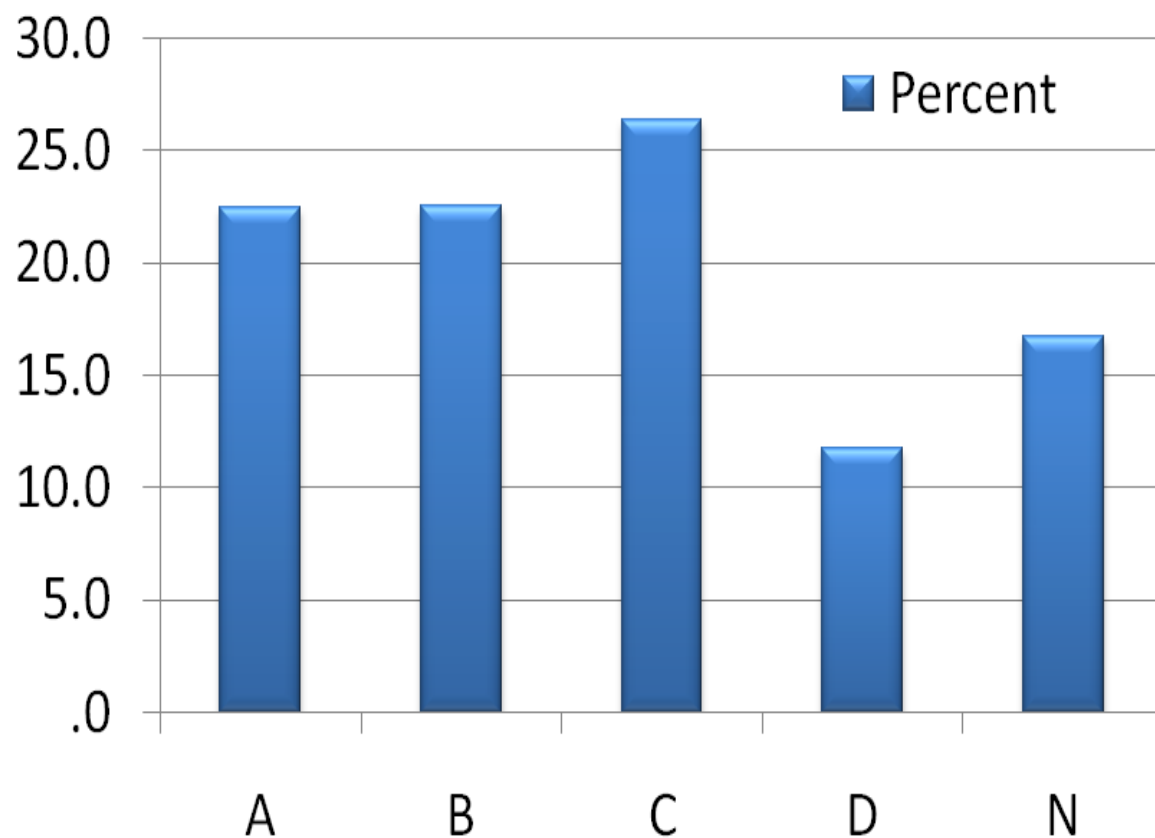


## Does SCHOLAR affect pupil's attainment?



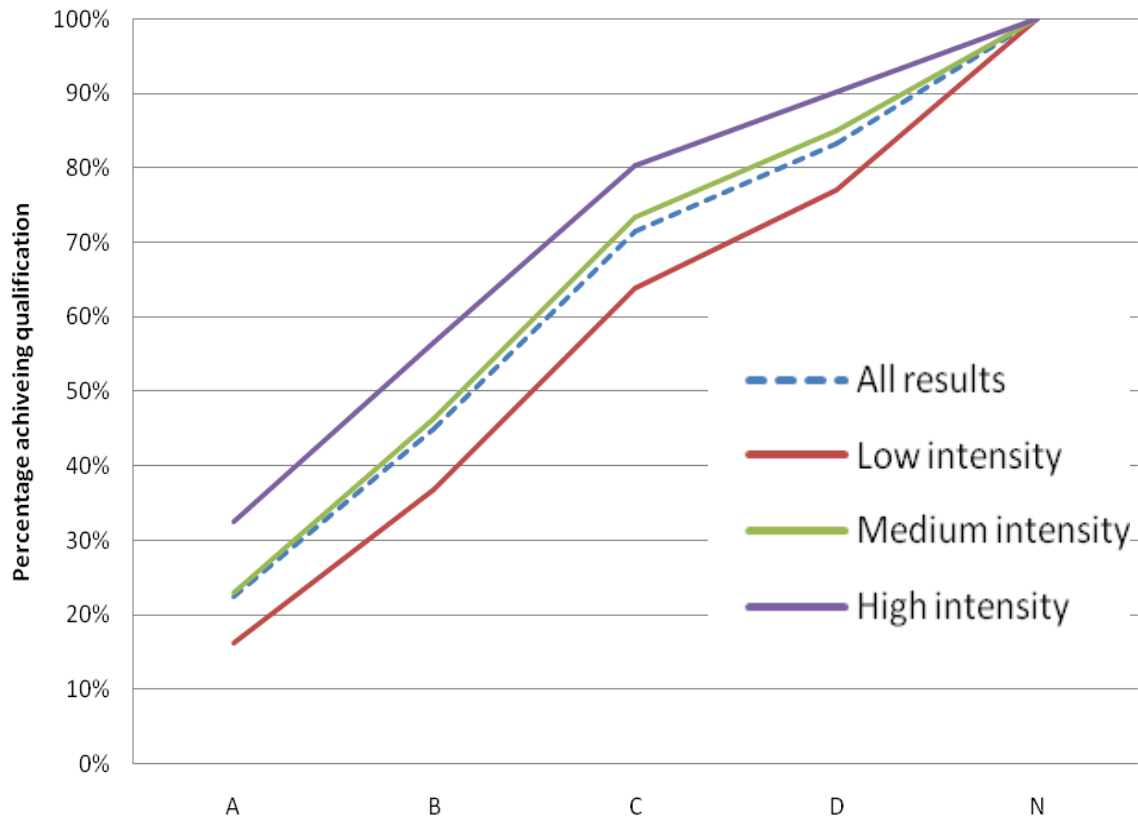
## Independent evaluation 2012

### Higher Biology 2010



## Independent evaluation 2012

### Higher Biology 2010



# SCHOLAR

A programme of Heriot-Watt University  
Prògram Oilthigh Heriot-Watt



## Questions?



<http://www.scholar.hw.ac.uk>