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Video and visual resources & technologies in teaching statistics

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Outline

- Video resources – levels, topics etc.
- Use of resources in teaching – student views
- Selecting videos – quality, accuracy etc.
- Make your own
- Technologies – Camtasia, Explain Everything, etc.

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Video

- Especially on **YouTube**

- Cover
  - Statistics
  - Quants methods (e.g. surveys)
  - Software – SPSS, R, SAS, Minitab etc.

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Videos - level

- School, A-level and equivalent. Especially for descriptive stats
  - http://youtu.be/81zcjULlh58?t=30s
- University level – often done by lecturers
  - http://youtu.be/mnbbRtFxWHA?t=6m7s
- Some take statistical/mathematical approach
  - http://youtu.be/MIqyiGvrUXE?t=2m5s
- Some use social science data (some use biological etc.)
- Lots demonstrate how to use SPSS etc. to do stats.
  - E.g. Andy Field http://youtu.be/Ekbkl7x6bNA?t=3m37s

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Excellent maths support

- Maths Tutor
- http://www.mathtutor.ac.uk/arithmetic/fractionsmultiplyinganddividing/video
  - to revise maths skills
  - basic arithmetic like calculating percentages and dealing with decimal numbers
  - introduction to algebra such as equations and squares
  - functions, graphs and series

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Typical topics

- Basic concepts
  - P-value, scales, levels of measurement, mean, median, mode, IV and DV, variables
  - http://youtu.be/GMIpnzLQtTQ?t=1m12s
- SPSS use
  - Getting started
  - Interface, data entry, data modification/recoding, charts
  - Exploratory analysis, crosstabs, chi-square
  - Regression, correlation
  - ANOVA, t-test, non-parametric equivalents

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Pedagogic use of video

- In class lecture
  - Can show only parts
  - Can pause and explain, excuse, etc.
- Use in guided independent study
  - Probably best if linked with lab instructions, used when needed, i.e. when doing assessment
  - Listen on mobile device while doing chores??
- Use in labs
  - Needs headphones to stop noise for others

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Student views of videos

- Find use in lectures good. Can follow and then practice in following lab.
- Use less frequently outside sessions
- Like ability to pause and replay
- Some used Maths Tutor site
- Some preferred to use textbook and reading material
- Prefer handwriting worked examples on screen to prepared PowerPoints

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Non video visual resources

- Reusable learning objects and other models
- Students directly manipulate and see results

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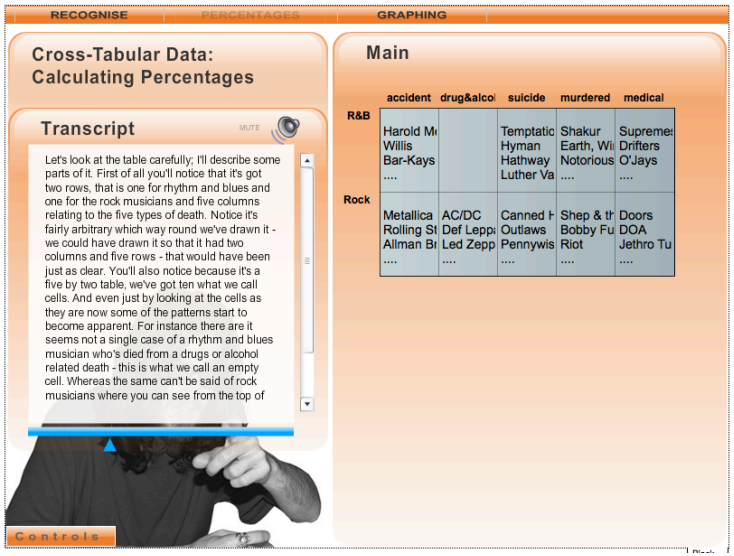
A learning object on creating and analysing tables of data

- http://www.ucel.ac.uk/rlos/cros_tab_data/main.html
- How to convert survey or experimental data into cross-tabular data and the steps involved in this process.
- Uses early deaths of band members
- Developed at the University of Cambridge.



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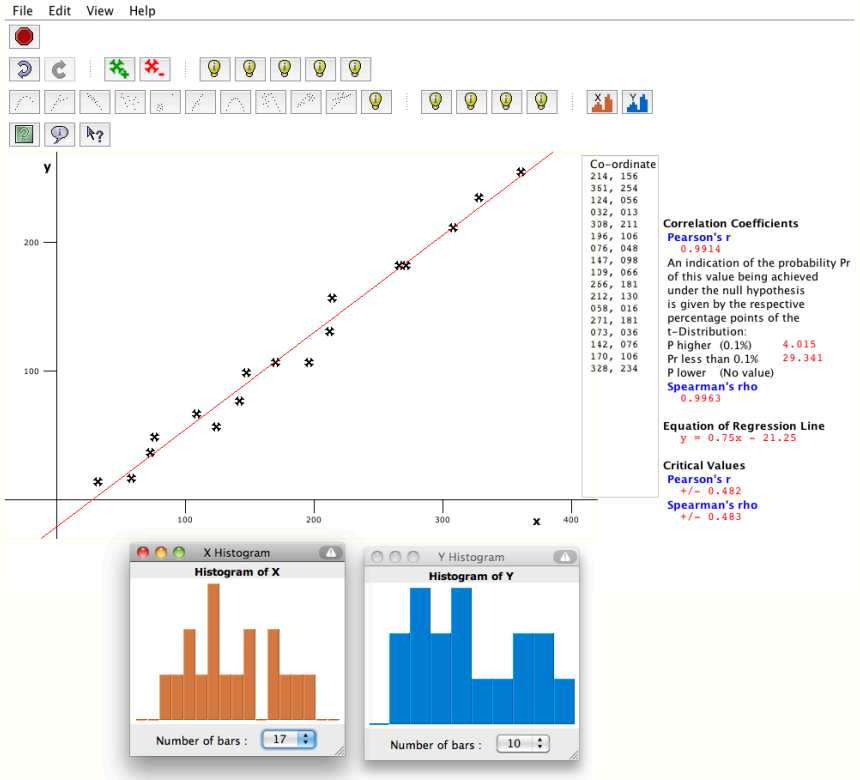
Correlation Explorer

- Software that allows you to manipulate points on a scattergram to see the effect on both the correlation statistics and the regression line. Use the buttons for canned scattergrams to quickly change the display.
- http://hhs.hud.ac.uk/w2/ltsu/Correlation.htm



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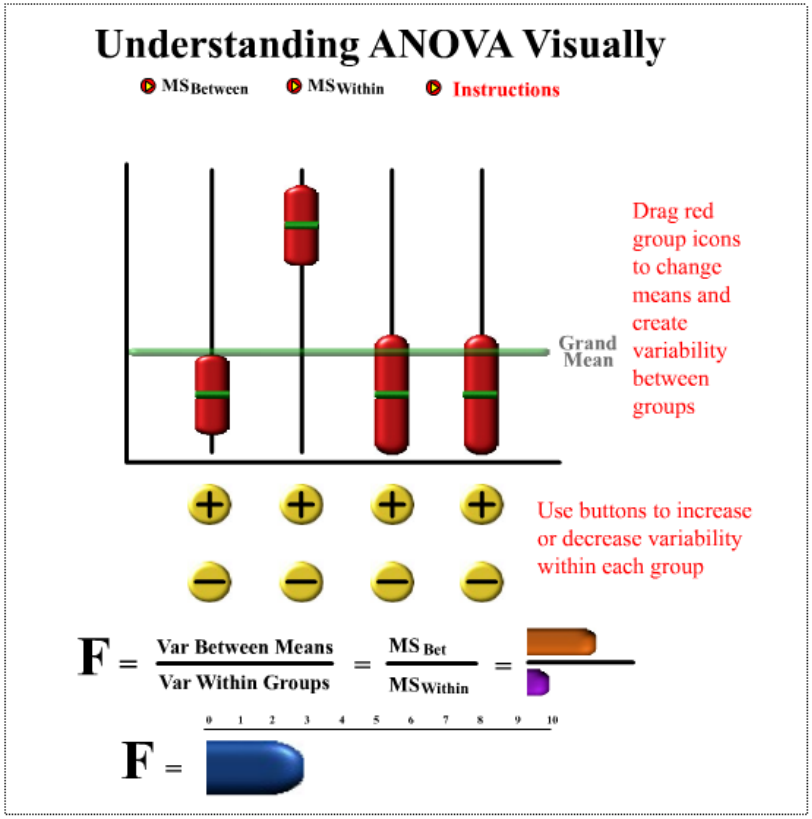
A visual tool for exploring ANOVA

- Understanding ANOVA Visually (1998, 2000) by Tom Malloy (University Utah, USA)
- http://www.psych.utah.edu/stat/introstats/anovaflash.html



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Selecting videos

- Are data sets used suitable?
  - Students like to have data they can relate to or relevant to their discipline.
- Statistical explanations
  - Depends on pedagogic approach
- Production quality
  - Good sound needed
  - Is the speaker too chatty/amateurish etc.

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Selecting videos 2

- Accuracy
  - Some videos get it very wrong
    - http://youtu.be/wHgl6TolySw?t=5m10s
- Debates in statistics
  - Should video include this or not?
  - Explaining discretion makes it hard for students

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Producing videos

Range of technologies:

- Camera, mic and digital editing suite
- Camtasia screen recording
- Flash/HTML 5
- Screen writing (with stylus and tablet) (Kahn University style) http://youtu.be/J1twbrHel3o?t=35s
- iPad solutions (include recording and screen writing)

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“Explain Everything” on iPad

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Making it accessible

- Short videos good
- Use screen writing – students like this
- Use graphics, visual devices etc.
- Sound quality – more impt. than picture
- Visual quality – depends. Needs good quality for text. HD can look more professional
- Visual aesthetics (composition, lighting etc.)
- Licensing – find free to use music etc.
- Copyright – Not at all clear, but now use the CC licence.

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Towards a pedagogy of the visual

- **Makes** the **abstract concrete**
  - As a metaphor (graphs)
  - As symbols (equations)
- Demonstrates **process**
  - Transformation, calculation, decision making
  - Change shown by visual changes
- **Time**:
  - So changes can be seen, manipulated, repeated, paused
  - Provides space/time for absorption.

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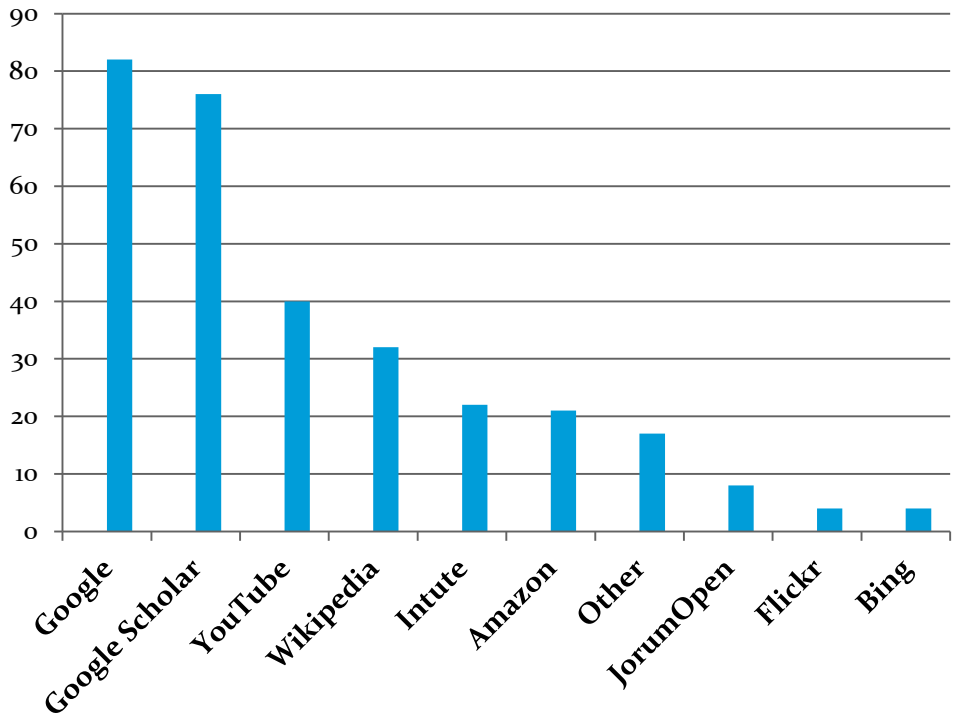
Sites used most often to search for resources



2011 study. N=99

Where third party resources have come from

Resource	%
YouTube:	***50***
Your Libraries' digital resources (such as e-Books):	*44*
Other courses on your Institution's VLE (such as Blackboard):	*32*
Professional body website:	*24*
HEA website:	***19***
Discipline specific website (such as OnlineQDA.hud.ac.uk):	*16*
Corporate website:	*14*
Another Institution's website / VLE:	*11*
National educational repository (such as JORUM):	*8*
Open access repository (such as OpenLearn):	*8*
iTunesU:	*8*
Box of Broadcasts:	*8*
Flickr:	*4*
Other (incl. own developed resources):	*3*
BUFVC:	*1*
MOOC / opencourseware (such as edShare):	*0*

Lots of use of available digital resources

2013 survey. N=115

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Conclusions

- Video – there's a lot out there
- Need care in selecting/recommending videos
- Make your own – technology is getting better and easier to use
- Google and YouTube to find