Using Tableau with Moodle for Visual Analytics

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LMS’s Data

- LMSs capture student in instructors “clicks”
- This is an important reason to use an LMS
- Could all this data be used to improve education?
- Challenge: How to access the data, analyze it, and interpret it

Moodle’s Databases

- Relational database management system (RDBMS)
- SQL – to query the database
- Example: “Complete Report”
- Many reports are textual, not graphic
  - Textual reports are harder to interpret!
- “A picture is worth a thousand word”
**Problem!**

- RDBMS lack robust visualization tools
- Export data to neutral format
- Create graphics with other product
- Common graphic product: MS Excel

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**Example: Excel**

- Export data from Moodle
- Import it to Excel
- Clean the data
- Produce the graphic
- Producing some graphic in Excel is challenging!

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**Why Tableau?**

- Analyzing massive data
- Need for more complex visualizations
- Browse the [www.tableau.com](http://www.tableau.com) website
Example: Tableau

- How do grades compare between online and face-to-face courses?
- What is the best way to explore and communicate this?

Tableau Visualization

- Box Plots
  - Lowest grade
  - Highest grade
  - Median grade
  - Inner 50% quartile
- Box plots for all nine courses
- Overall average
- Overall median
- Dots: dot plot
Interpretation

- Online students do as well, maybe better than face-to-face students
- One under-performing student
- More online students are above the average
- Some courses better than average, some worse (as expected with means)
- What do you see?

Results

- We want to know more
- Why?
  - Same resources
  - Same quizzes
  - Same assessments
- Good visualizations beg for deeper probing

Quantitative and Visual Techniques

- Are there relationships?
- Cause?
- What other data will help?
How was this graphic produced?

- An quick overview, not experts
- Not enough time to show all Tableau features
- An appreciation of what Tableau can do

Learning Tableau

- Tableau, like Moodle, are leaders in their markets
- This means: lots of learning resources
- Tableau is not open-source, must buy it
  - 14-day demo
  - Free instructor licenses

Tableau Demo

- Connect to data source, there are many
- Connect to MySQL database, Moodle
- A live connection to Moodle!
Using Data in Tableau

- Drag and drop database tables
- Tables are “joined”
- Results are shown below
- Or write custom SQL!

Rick's Technique

- Develop queries using phpMyAdmin
- Move developed queries into Moodle's “Configurable Reports” plugin
- Create a database “view” from this query
- Use the view in Tableau

Creating the Graphic
Creating the Graphic (continued)

Conclusions

• Tableau has some interesting possibilities
• Directly connecting to your moodle database seems powerful
• Ability to use SQL is very useful
• Disadvantages
  • Must buy it
  • Must learn it
• I hope to return and show you more!

The End

• For more support, including this video, go to
  www.rjerz.com