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
Example: Excel

- Export data from Moodle
- Import it to Excel
- Clean the data
- Produce the graphic

- Producing some graphic in Excel is challenging!
Why Tableau?

• Analyzing massive data
• Need for more complex visualizations
• Browse the 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

MBA Business Analytics - Course Comparison
Final Grade Distributions

Median: 96.8
Average: 95.3

Online Courses:
- MBA8150-S16
- MBA8150-F16
- MBA8150-S17
- MBA8150-S17-OL
- MBA8150-Su17-OL
- MBA8150-F17
- MSC9100-F17
- MBA8150-S18
- MBA8150-S18-OL
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!
• 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