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

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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!

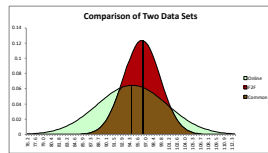- "A picture is worth a thousand word"

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Problem!

- RDBMS lack robust **visualization tools**

- **Export** data to neutral format
- Create graphics with other product

- Common graphic product: MS **Excel**

Example: **Excel**

Comparison of Two Data Sets

- **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
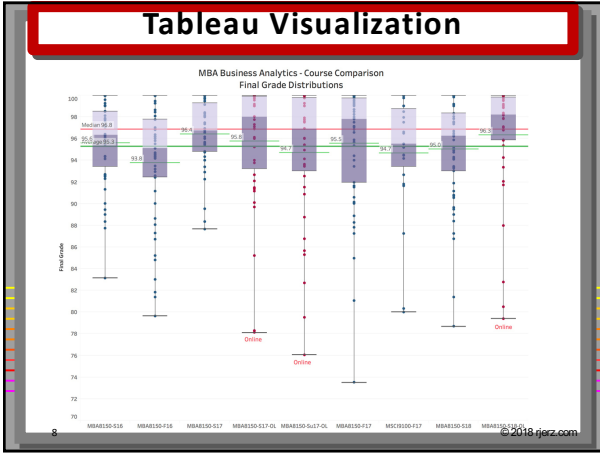Final Grade Distributions

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

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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

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Tableau Demo

- **Connect** to data source, there are many

- Connect to MySQL database, Moodle

- A **live connection** to Moodle!

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Using Data in Tableau

- Drag and drop database tables
- Tables are "joined"

- Results are shown below

- Or write custom SQL!

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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

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Creating the Graphic

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Creating the Graphic
(continued)

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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!**

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The End

- **For more support, including this video, go to**

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