



EFFECTIVE ONLINE STATISTICS INSTRUCTION

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TOPICS

- Open Source Resources
- Discussion Boards
- Group Project

OPEN EDUCATIONAL RESOURCES

**ONE DOES NOT
SIMPLY**



APPLY THE CENTRAL LIMIT THEOREM.

meme-generator.net

OPEN SOURCE TEXTS

- Openstax – www.openstax.org
- Center for Open Textbooks - <https://open.umn.edu/opentextbooks/>
- College Open Textbooks - <http://www.collegeopentextbooks.org/>

OPEN SOURCE RESOURCES

- Stanford University – <http://online.stanford.edu/course/probability-and-statistics-self-paced>
- Datacamp - <https://www.datacamp.com/introduction-to-statistics>
- Introduction to Statistics Video MOOT - <http://www.mathandstatistics.com/introduction-to-statistics-video-moot>

OPEN SOURCE TUTORIALS

- Using R – <http://www.r-tutor.com/elementary-statistics>
- Stat Trek - <http://stattrek.com/tutorials/statistics-tutorial.aspx>

**IF HOTNESS WAS A NORMAL
DISTRIBUTION**



**YOU'D BE 3 STANDARD DEVIATIONS ABOVE
THE MEAN.**

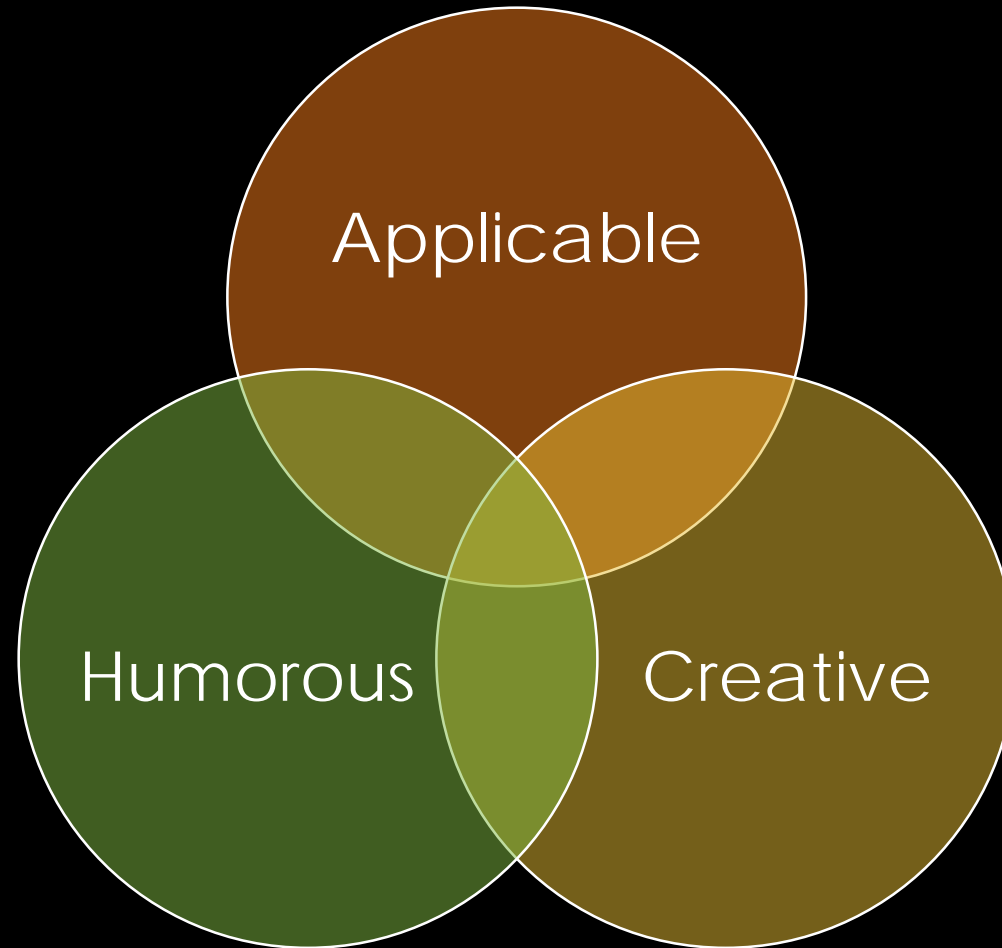
nemegenerator.net

DISCUSSION BOARDS

DISCUSSION BOARDS

- Create a unique data set using student information.
 - Height
 - Number of family members
 - Shoe Size
 - Pets
 - Favorite Ice Cream Flavor
 - Age of coins

DISCUSSION BOARDS



WHY INCLUDE HUMOR?

- Chabeli (2008)
 - Use of humor stimulated an engaged and relaxed atmosphere.
- Matarazzo, Durik, and Delaney (2010)
 - Students reported greater task interest in math when their learning was humorous rather than non-humorous.

DISCUSSION BOARDS

- Class Data Sets
- Real Estate
- Weather
- Stock Prices
- Back Stories

DISCUSSION BOARDS

There is an Electric Bassist Convention being held in a dilapidated old school building (the best venue these starving musicians could afford). There are 23 bassists in attendance. (50 RSVP'd, but of the other 27, 2 got lost, 3 forgot, and 21. couldn't get out of bed in time. Oh, and 1 had a gig to get to.)

It is a well known fact that exactly **87% of all bassists worldwide are left-handed**. (no, of course not. But let's assume 87% for this question. We will assume for this problem that you can **only be left or right handed** in order to ensure we can use the binomial (only 2 options) distribution. This probability value is constant for all bass players in the world therefore the probability is the same for all bass players who actually made it to the convention in one piece (another condition of the binomial).

GROUP PROJECT

THIRD TIME'S THE CHARM?

FALSE.

**EACH TIME HAS AN EQUAL
PROBABILITY OF BEING THE CHARM.**



GROUP PROJECT EXPERIENCE

- Converting in-seat classroom projects to online ones.
- Older online projects that can be updated because newer technology available, more (or less) technology available, or its just time for something fresh.
- Starting from scratch with an online project?

PLANNING AND PREPARATION

- What do you feel would serve the students best through working in groups?
- What are your learning objectives?
 - Content application
 - A framework for working in groups
 - Practice run for student before...

COURSE DELIVERY & LMS

- Synchronous - 9 weeks @ 3.5 hours in Adobe Connect
 - Breakout rooms during live session
 - Group discussion boards for each week
- ...
- Totally asynchronous
 - Group discussion boards for each week
- ?
 - Other programs, apps, and tools approved for use

GROUP WORK DESIGN

Instructor's role varies depending on type of project, time allotment, and technology capabilities.

- **Short Term Project (2 – 3 weeks)**

- Instructor provides more of the components
- Examples: **Data Sets** (textbook, Census at School United States) and **Templates**

- **Long Term Project (5 – 7 weeks)**

- Instructor facilitates students more on the components
- Examples: **Link to a survey** to create a data set and **deliverables document**

HOW DO YOU GROUP?

- Instructor creates groups
 - Randomly
 - Systematically
 - By Engagement / Grades
- Self-selection
- Some type of compromise
- ?

GROUP WORK DESIGN

Assigned Roles:

- Determine roles before problem is presented to students.
- Roles can be assigned by the team or instructor

Main roles:

- Group Leaders/Presenters
- Group Scribes (Word and editing, Excel, Power Point)
- Other scenario-specific roles (librarian or researcher)

GROUP WORK DESIGN

Team Rules (Establish before problem is presented to students)

- **Guidelines can be assigned by the team or instructor**
 - Deadlines & timetables
 - Communication protocols
 - Dispute resolution measures
 - Workload distribution
 - Firing Process
- *My firing rulecoming up*

GROUP WORK DESIGN

Code of Ethics:

- Discuss behavioral expectations before problem is presented to students
- Standards can be assigned by the team or instructor
- Include conversations about:
 - Peer Critiques/Evaluations
 - Personalities
 - Quality
 - Timeliness
 - Communication

GRADING PROJECT

Final Course Grade: Exams = 60%, Homework & Quizzes = 10%, Individual Project (weeks 3-5) = 10%, Group Project (weeks 7 – 10) = 20%.

20% Group Project Grade is based on 100 points with

- 3 weekly individual grades @ 10 points each = 30 points.
- Group grade on completeness and correctness of the final presentation = 50 points.
- Individual grade on delivery of presentation OR question and answers = 20 points.

Firing Rule: If the team fires you can do the entire project on your own and present. You cannot earn the individual grade given to you by the group. Max score is 70 points.

LESSON PLAN TEMPLATE

Course: MATH 222 – Statistics

Goal: To develop students' research and problem solving skills in the areas of correlation and simple linear regression using collaborative strategies in the classroom.

Rationale: Problem solving and team learning are essential skills for being successful in the workplace.

LESSON PLAN TEMPLATE

Instructional Objectives:

- Serve as an active participant in a collaborative group setting.
- Utilize problem-based learning components (playing by team rules, following code of ethics, and maintaining assigned roles)
- Perform correlation and simple linear regression methods using Excel.
- Execute a 15 minute group presentation in a synchronous setting. (Post to a discussion board and facilitate question and answers.)

LESSON PLAN TEMPLATE

Performance Criteria: (Assessing active participation and using PBL components)

- Students will complete weekly group reports (Google form or your favorite data collection method.)
- Give each member including themselves a grade from 0 – 10 on weekly participation and cooperation in weeks 7, 8, and 9.
- Must provide written comment(s) on each member and notes to the instructor about specific group issues that may need to be addressed by the instructor before the next class.

LESSON PLAN TEMPLATE

Performance Criteria: (Assessing Active Participation)

- Answers a weekly reflective question like
 - Share one thing they learned about each group member.
 - Share one thing they taught someone in the group as well as one thing they learned from someone in the group.
 - Share one thing they like about working in groups as well as one thing they did not like about working in groups.

LESSON PLAN TEMPLATE

Performance Criteria: (Assessing using correlation and simple linear regression methods using Excel)

- Students check each others work from week 7 to week 8.
- Group decisions are made on how to proceed with next steps.

LESSON PLAN TEMPLATE

Performance Criteria: (Assessing the group presentation)

- Editors are responsible for consistency of slide presentation.
- The power point gurus build it, by combining each group members 3-4 slides into one presentation.
- The group leaders act as presenters to the entire class. However, all members are part of the panel and responsible for questions and answers about the presentation.
- Power point presentation is submitted with verification document digitally signed by all participants.

LESSON PLAN TEMPLATE

Detailed Agenda: Prepare each component as detailed as possible. Consider:

- What does the learner need to proceed with each step?
- How much time will I allow for each step?
- Do I have something I could cut if necessary?
- Do I have something I could add if necessary?
- Develop pre and post project surveys, weekly group report (forms or documents), handouts and other resource materials.

PROJECT DESCRIPTION

What does the student see?

- The objectives of the project.
- Guidelines on assigning roles, the team rules and code of ethics.
- Useful resources.
- Weekly guidelines towards completion.
- How the project will be graded.

PROJECT DESCRIPTION

Week 7:

- Elect 2 group leaders. Group leaders are also the group presenters and will be referred to as presenters throughout the rest of the document. They should feel comfortable with talking to the class, leading and helping others in the group, decision making, and the material on correlation and regression.

EXCERPTS- WEEK 7

Decide the role of other group members. Members 3 and 4 should be comfortable with building a power point presentation from slides others provide. It may be useful for them to have a laptop that can be brought to the class each week. Members 5 and 6 should be comfortable with Word and have an eye for detail and following directions.

EXCERPTS- WEEK 7

- Fill out the group info sheet before leaving class. Make sure each group member has a final copy before adjourning. Once the sheet is completed it is final. If a group member is absent, you may not assign him/her to be a leader.
- Complete the group work report before you leave.
- If time, start on "before week 8 class".

INFO SHEET

Group A Info sheet

Leader/Presenter 1: _____ Email: _____

Leader/Presenter 2: _____ Email: _____

Member 3: _____ Email: _____

Member 4: _____ Email: _____

Member 5: _____ Email: _____

Member 6: _____ Email: _____

Group A Regression Assignments

Group A	member	independent	dependent		reviews	with
	m3	NH	HT		m4	p1
	m4	FA	NH		m3	p1
	m5	AS	FA		m6	p2
	m6	HT	HC		m5	p2
week8	p1			females		
week8	p2			males		

EXCERPTS- BEFORE WEEK 8

- Check that you can email and receive email from all group members. You should be checking your email at least 3 times each week. "I didn't check my email" is not an acceptable excuse.
- Download the data set from the public drive. You will also find a project description there.
- Members 3 – 6 should complete their assigned regression as well as their reviewer's regression using Excel as described above. You will use the entire sample. You will need to screen share, email, or post your results so you, your reviewer, and one of the presenters can review the work next meeting for correctness.

EXCERPTS- WEEK 8

- Review and make corrections to the 4 regressions. (To be done by all group members).
- Decide, as a group, which one regression to explore in more detail.
- Complete the work report survey before you leave.

EXCERPTS- BEFORE WEEK 9 CLASS

- Presenter 1 and 2 will explore the selected regression by performing a regression by groups, male vs female. Each will do both regressions in order to check each others work. It would be best if you could get together outside or before class to compare.
- Members 3 – 6 should complete 2-3 power point slides summarizing their (corrected) work.
- If presenter 1 and 2 can meet outside of class before week 9, they may and should proceed with preparing their own 2-3 slides as above.

EXCERPTS- WEEK 9

- Continues in same fashion
 - Time for reviewing the slide set as a whole, preparing (editing) new slides by P1 and P2 to be added.
 - Complete the groups work report.
-
- Live Presentations – Week 10
(or post and facilitate)

ROLE AS FACILITATOR

- Move from break out to break out each week.
- Class time given is about 1 – 1 ½ hours per week.

INFO SHEET

Group A Info sheet

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Leader/Presenter 2: _____ Email: _____

Member 3: _____ Email: _____

Member 4: _____ Email: _____

Member 5: _____ Email: _____

Member 6: _____ Email: _____

Group A Regression Assignments

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	m5	AS	FA		m6	p2
	m6	HT	HC		m5	p2
week8	p1			females		
week8	p2			males		

REFERENCES

Chabeli, M. (2008). Humor: a pedagogical tool to promote learning. *Curationis*, 31(3), 51-59.

Matarazzo, K. L., Durik, A. M., & Delaney, M. L. (2010). The effect of humorous instructional materials on interest in a math task. *Motivation & Emotion*, 34(3), 293-305. doi:10.1007/s11031-010-9178-5

THANK YOU

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