



## EDTECH 651: Introduction to Statistics for Educational Technology

Department of Educational Technology

Boise State University

Fall 2018, Section 4202



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**Course:** [Moodle Learning Management System](#)

**Office Hours:** By appointment.

### Course Materials:

#### 1. Recommended Textbook:

- Levin, J., Fox, J. A., & Forde, D. R. (2014). *Elementary Statistics in Social Research: The Essentials* (12th ed). Publisher: Pearson ISBN-13: **978-0205845484** ISBN-10: **0205845487**  
*Note: You need a textbook- any edition of this textbook will be ok, but make sure you know what is different between editions and what additional information you will need to cover the material.*
- Pallant, J. (2013). *SPSS survival manual: A step by step guide to data analysis using the SPSS program* (6th ed). (For information, go to <http://www.allenandunwin.com/spss/default.html> )  
*Note: Any SPSS manual will serve you for this course*
- American Psychological Association. (2010). *Publication manual of the American Psychological Association* (6th ed.). Washington, DC: Author.

#### 2. Other Readings

- Research articles
- Other documents or chapters that students will find to prepare their mini-projects and the final project

#### 3. Required Software

SPSS, a computer program used for statistical analysis, is also required for this class. The most updated version of SPSS is version 25. Students and educators are eligible for discounts for certain software. Two places you can purchase software at a discount are: BSU Bookstore and Academic Superstore. I would recommend you purchase a one-year online license for SPSS from this website <http://studentdiscounts.com/spss.aspx?gclid=CPL9pY6vqqOCFYJdtgodQWJZKA>. (If you are familiar with and have access to SAS, you can use SAS for this course. But the tutorials in the course will only be on SPSS.)

***The instructor is not responsible for any text or software that is not obtained in enough time to complete the assignments.***

### **Course Description:**

During this course, we will discuss common statistical concepts and will apply in research on educational technology. First, we will discuss elements necessary to understand quantitative designs such as measures of central tendency and variability; then we move to confidence intervals, one and two sample tests, and chi-square test. At the end of the course, we will cover bivariate correlation and analysis of variance.

If you have questions or need help, please contact your instructor by phone, email, or by posting a note on the class discussion board. The best way is **email!!** I will do my best to respond within 24 hours on weekdays. Weekend messages will be answered on Mondays. You can also get help regarding Moodle from the Moodle Support Page at <https://edtech.mrooms.org/mod/page/view.php?id=625>

### **Previous Knowledge:**

Fundamental algebraic skills, such as slope and equations of lines. Basic arithmetic knowledge, such as fractions, negative numbers, and percentages. In addition to an understanding of algebraic expressions and linear equations.

### **Course Objectives/Goals**

Following the Community of Inquiry, members of the class will support each other during the different social, cognitive and teaching moments presented in the various activities planned for this course. After successful completion of this course, students will be able to apply the educational research design process to answer research questions.

Regarding the statistical/quantitative research content:

1. identify and formulate educational technology research questions appropriate to be answered with statistical methods;
2. summarize and describe data according to educational technology research questions;
3. understand common statistical concepts, such as hypothesis testing, critical values, and p-values, confidence interval, etc., in educational research;
4. evaluate whether or not a statistical procedure is appropriate for a particular research question;
5. identify and articulate differences between/among statistical analysis methods;
6. critique and evaluate statistical analysis methods in educational technology literature.

On SPSS

1. Organize data in SPSS;
2. Perform and explain descriptive analysis using SPSS in educational technology research
3. Perform and interpret inferential analysis using SPSS in educational technology research;
4. Interpret outputs from SPSS

## Requirements

1. A personal, internet-connected computer to which you have regular access
2. Access to SPSS
3. Accounts on Google Drive
4. A microphone and a webcam to create video and participate in video chats via the computer
5. Materials downloaded from the course learning management system

## Assignments and Grading Summary:

Assignment	Times	Points per group of assignments
Discussions	5	125 points
Homework	6	150 points
Mini-Projects	2	200 points
Case Studies	2	200 points
Final Presentation	1	75 points
Peer Feedback	2	150 points
Final Project	1	100 points
Meeting with Instructor	At least 2 (1 indiv., >= 1 group)	50 points
Total		1050 points

## Description of the Assignments:

**Discussions.** We are using a discussion forum for five of the seven modules; the purpose is to interact and present ideas on how to apply the content to your particular research area of interest. Try to maintain the same topic/research idea during the whole semester. In case you need to change your research project, please make sure to explain the new idea in your post.

**Homework.** Each module has an assignment to complete related to the content. It may include some multiple-choice questions, open-ended questions, and tasks involving SPSS.

**Mini-Projects.** You will complete two mini-projects through the semester. These mini-projects are designed to facilitate your further understanding of the key statistical concepts and most importantly the applications of those concepts in your research idea/project. The mini-projects will be the process to create your final project. Working hard on these mini-projects will help you to have a stronger project at the end.

**Case Studies.** You will analyze two case studies (quantitative research articles) during the semester. The purpose of the projects is to allow you to get a deeper understanding of the content by analyzing journal articles that follow quantitative research approaches. Make sure you pay attention to how the author discusses the ideas, describes the data collection, as well as how s/he presents data analysis processes. Case Studies will work as examples on how to write your project.

**Final Presentation.** You will create a video presentation of your project to the class, and you can use the video format of your preference. The presentation should be professional. Your presentation should be between 5 and 10 minutes long.

**Peer Feedback.** During the semester you will have a chance to read the mini-project of one classmate and provide feedback. The feedback should be a constructive critique that helps your peer improve their project.

**Final Project.** This assignment is the result of all your efforts during the semester.

**Meetings with Instructor:** During this semester you will meet at least two times with the instructor (synchronous meetings). One meeting is individual to talk about your research interest, some research ideas, etc. Group meetings will be scheduled to provide the space to discuss concepts, clarify assignments, etc.; and you have to make sure to participate in at least one of these meetings.

Individual Meeting: For this course, you **have to schedule** one individual meeting with the instructor **by Aug 31**. Individual meetings will occur between Sept 7 and Sept 15. The instructor will send a doodle schedule by Aug 24.

Group Meetings: For this course, you have to participate in at least one of the group meetings scheduled by the instructor. Group meetings are intended to be just a space to interact, ask questions. There is a topic proposed for each meeting, but conversation should not be limited to that. We can talk/discuss about assignments, course content, research ideas, research resources, etc. Be prepared to participate in the discussion and bring questions you may have. At this point, I am planning for us to meet:

Date	Time (Mountain Time)	Proposed topic
September 5	6:00 to 7:00 p.m.	Q&A Research topics
September 20	5:00 to 6:00 p.m.	Q&A Mini-Project 1
October 17	6:00 to 7:00 p.m.	Q&A Mini-Project 2
November 15	5:00 to 6:00 p.m.	Q&A Reporting results
December 5	6:00 to 7:00 p.m.	Final project and presentation

If none of these days/ times work for you, please let me know **by August 26**. In this way we can find another day/time and let all know about the changes.

### Schedule, Topics, and Assignments (Tentative)

Topics	Tasks	Due*
Module 1: Welcome and Orientation to the Course	Orientation and introduction to the course	By Aug 27: Introduction (video) and Scavenge Hunt Activity
Module 2: Measurement Issues and Organization of Data; Introduction and Overview of SPSS	Chapters 1 & 2; Input, output, organization of data in SPSS	By Sept 3: Discussion and Homework By Sept 10: Discussion (response) and SPSS exercise
Module 3: Initial Discovery with Data: Central Tendency and Variability	Chapter 3 & 4; SPSS	By Sept 17: Discussion and Homework By Sept 24: Response and Mini-project 1
Module 4: One and Two Samples Tests	Chapter 5, 6 & 7; SPSS	By Oct 1: Homework By Oct 8: Mini-Project peer-review By Oct 15: Case Study 1
Module 5: The chi-square Test	Chapter 6 & 9; SPSS	By Oct 22: Discussion and Homework By Oct 29: Mini-project 2
Module 6: Introduction to Bivariate Correlation & Analysis of Variance	Chapter 8 & 10; SPSS	By Nov 5: Discussion and Homework By Nov 12: Response and Case Study 2
<i>Thanksgiving Holiday</i>		
Module 7: Reflecting on Your Learning	Chapter 13	By Nov 26: Final presentation and Final Draft (peer feedback) By Dec 3: Feedback to a peer's document By Dec 10: Final Project

**Module Assignments and Total Estimated Points Allocation** (subject to change)

**\*Note:** Meetings with instructor are not included in this table

	<i>Module 1</i>	<i>Module 2</i>	<i>Module 3</i>	<i>Module 4</i>	<i>Module 5</i>	<i>Module 6</i>	<i>Module 7</i>	<i>Subtotal</i>
<i>Discussion</i>	25	25	25	--	25	25	--	<b>125</b>
<i>Homework</i>	25	25	25	25	25	25	--	<b>150</b>
<i>Mini Projects</i>	--	--	100	--	100	--	--	<b>200</b>
<i>Case Studies</i>	--	--	--	100	--	100	--	<b>200</b>
<i>Final Presentation</i>	--	--	--	--	--	--	75	<b>75</b>
<i>Peer- feedback</i>	--	--	--	75	--	--	75	<b>150</b>
<i>Final Project</i>	--	--	--	--	--	--	100	<b>100</b>
<i>Synchronous meeting with instructor</i>	1 Individual and at least one group meeting (25 points each)							<b>50</b>
<b>Grand Total</b>								<b>1050</b>

*Detailed info about assignments, projects and case studies will be available in specific modules.*

## Equipment

This is an online course requiring a computer with speakers and an Internet connection. Minimum hardware requirements for the EDTECH online courses may be located at: <https://edtech.boisestate.edu/admissions/hardware-and-software-requirements/>

Software Requirements: Current software requirements for the EDTECH program: <https://edtech.boisestate.edu/admissions/hardware-and-software-requirements/>  
For some software, an academic discount is available for students and teachers with proof of eligibility. Here are two places where you can obtain the academic (lower priced) versions of the software:

Boise State Bookstore: <http://www.boisestatebooks.com/> (Click Technology/Software)

Academic Superstore: <http://www.academicssuperstore.com/> (Search for titles)

Antivirus Software: Please make sure to have up to date antivirus software installed and running on your computer.

Popup Blocker: This is highly recommended. Google has one built into their free toolbar if you want to try it: [http://toolbar.google.com/T4/index\\_pack.html](http://toolbar.google.com/T4/index_pack.html)

Free Software: Please make sure that the following are installed and up to date on your computer.

Adobe Reader: <http://www.adobe.com/products/acrobat/readstep2.html>

Flash Player: <http://www.adobe.com/products/flashplayer/>

QuickTime Player: <https://support.apple.com/downloads/quicktime>

Firefox Web Browser: <http://www.mozilla.com/en-US/firefox/>

Internet Connection: Of course, an Internet connection is required to participate in this online course. If you have a high-speed connection it is preferable to dial-up access. If you only have dial-up access you can still get by, but patience is a virtue when waiting for files to download.

## Course Policies

**Time Management:** An online course can take a considerable amount of time. For this reason, I would strongly suggest beginning each assignment early. Work on it regularly over the week rather than waiting until the last day or two. This will allow you to have the chance to work out problems or get help if needed.

**Participation:** Depending on the class activities, you are responsible for completing weekly assignments, participating in discussion groups, and checking in to the course site on a consistent basis.

**Assignments:** You will always be given explicit instructions on where to send your assignments. Assignments are usually due on Mondays (by 11:59 pm). The exact dates will always be found in the activities.

**Advanced Copies of Assignments:** Assignments might not be handed out in advance. Often times a lesson can be changed prior to posting. This policy is to ensure that you always have the most accurate and up-to-date information available to you. I try to post our assignments early, but this is not a guarantee.

**Late Assignments:** Sometimes situations occur that prevent us from working on our assignments on time especially with many of your busy schedules. During the course, every student will be permitted one late assignment without losing any points; however, the assignment cannot be turned in more than one week late. Any other assignments that are late past this first initial late assignment will have one

letter grade per day deducted from it. ***During the last two weeks of class, all assignments must be turned in on time and cannot be submitted late.***

The instructor is not responsible for any text or software that is not obtained in enough time to complete the assignments.

**Backing Up Your Files:** You will be offered several ways to save your work online. However, you should always save your work on another storage device on your own computer. I cannot stress this enough.

**Faculty Initiated Drop:** Please be advised that if you do not "attend" class at least once during the first week, I will drop you from class. Since this is an online course, this requirement means that you **MUST** be present in our Moodle course site during the first week and participate in the introductions.

**In Process (IP):** Please be advised that I strictly follow the rules for in process (incomplete). In order for me to give you an IP in this course, the following two criteria **MUST** be met:

Your work has been satisfactory up to the last three weeks of the semester.

Extenuating circumstances make it impossible for you to complete the course before the end of the semester.

In order to receive an IP, we must create a contract stipulating the work you must do and the time in which it must be completed for you to receive a grade in the class. The contract time may not exceed one year. If no grade other than IP has been assigned one year after the original IP, the grade of 'F' will automatically be assigned. The grade of 'F' may not be changed without the approval of the University Appeals Committee. You may not remove the IP from your transcript by re-enrolling in the class during another semester. A grade of IP is excluded from GPA calculations until you receive a final grade in the course. If I assign a grade of IP you will receive an email notification that you have "Registrar To Do Items" on BroncoWeb.

**Student Code of Conduct:** It is expected that students in this class will create original works for each assignment. We will follow the BSU Student Code of Conduct . In the event of academic dishonesty a complaint is filed with the BSU Student Conduct Office with supporting documentation. This complaint remains on file and actions may be taken against the student (e.g., loss or credit, grade reduction, expulsion, etc.).

We will also observe U.S. copyright laws in this course. Several great links to copyright information are available on the BSU Albertson's Library site

at: <https://library.boisestate.edu/researchsupport/copyright/>

In addition to the above, please respect the following guidelines:

1. Please submit original work for each project. Projects that were created for other classes may not be submitted for credit in EDTECH 651. Each project may only be submitted for credit one time by the person who created it. The BSU Student Code of Conduct states: "Academic dishonesty also includes submitting substantial portions of the same academic course work to more than one course for credit without prior permission of the instructor(s)."

2. All project text should be original text written by the student who is creating the project. The exception to this is the use of small amounts of quoted material that is properly cited. Copying and pasting from other Web sites or projects (including the instructor's examples) is not allowed.

3. Images and sound clips used in projects should be original, or used with permission of the owner, or come from the public domain. Please check terms of use on sites containing these items.

4. Please cite the source(s) for materials that are obtained for your projects unless they are created by you. If permission is granted for use of copyrighted materials please post a statement explaining that



near those materials.

**I may use some plagiarism detection utilities to test random assignments.** Contact me if you have any questions regarding this issue. Thank you for abiding by the Course Policies.

### Grading (Points Allocation)

Each assignment will be graded based on given criteria and a rubric each week as outlined in the Assignment. You can check your progress in Moodle by clicking the Grades link on the left-hand navigation bar. Progress is updated as assignments are evaluated throughout the semester.

Grades in this course will consist of three major components:

1. Preparation/participation
2. Mini projects/case studies
3. Module exercise assignments

Point values will be specified when the assignments are posted. I reserve the right to adjust these percentages, either collectively or individually, as necessary. Grade Scale: Based on percentage of total points attained:

- A+ 99-100% (for example: only obtained points are more than 1039 can be awarded A+)
- A 93-98.9% (> 976)
- A- 90-92.9% (>945)
- B+ 88-89.9% (>924)
- B 84-87.9% (>882)
- B- 80-83.9% (> 840)
- C+ 78-79.9%
- C 74-77.9%
- C- 70-73.9%
- D 65-69.9%
- F < 65%

If the cost of this course is being reimbursed by your district or school, please review the policies regarding the minimum grade required for a complete reimbursement. It is not the responsibility of the instructor to assure a grade that meets those requirements.

### AECT Standards Addressed

Standard	Assignment
<b>Standard 2: DEVELOPMENT</b>	
1. Integrated Technologies <i>Integrated technologies are ways to produce and deliver materials which encompass several forms of media under the control of a computer</i> 2.0.5 Apply appropriate evaluation strategies and techniques for assessing effectiveness of instructional and professional products.	Mini Projects / Case Study
<b>Standard 3: UTILIZATION</b>	
3.2 Diffusion of Innovations <i>Diffusion of innovations is the process of communicating through planned</i>	Mini Projects / Case Study/ Peer-feedback

Standard	Assignment
<i>strategies for the purpose of gaining adoption.</i>	
<b>Standard 5: EVALUATION</b>	
5.3 Formative and Summative Evaluation <i>Formative evaluation involves gathering information on adequacy and using this information as a basis for further development. Summative evaluation involves gathering information on adequacy and using this information to make decisions about utilization</i>	Mini Projects / Case Study/Peer-feedback

Source: AECT Accreditation Standards for Programs in Educational Communications and Instructional Technology (ECIT) <http://www.aect.org/standards/initstand.html>

### **Modification of the Syllabus and Schedule**

I reserve the right to modify the syllabus and schedule at any time. Notice of any change will be emailed and posted as an announcement.

\*\*\*This course was originally created by Dr. Dazhi Yang, and I made some changes based on my personal preferences.