

COMBINING SOCIAL BETTERMENT AND INCLUSIVE TEACHING VIA DISCUSSION BOARDS IN BASIC AND INTERMEDIATE STATISTICS

Ngoc Phan, Crystal Luce, & Courtney Donovan

To use Statistics and Data Science courses to address social injustice, our methods of teaching must aid in deconstructing oppressive ideologies. To truly facilitate transformative learning, we must start by examining how our pedagogies reinforce dominant narratives and silence marginalized perspectives. This requires intentional reflexive methods to create inclusive spaces where individuals critically engage with the material. Mark, Henry, & Julnes (2000) define Social Betterment as “the reduction or prevention of social problems, the improvement of social conditions, and the alleviation of human suffering.” Inclusive Teaching is a pedagogy that focuses on the needs of all students to support course engagement and includes a range of approaches geared towards creating a space that decenters whiteness in statistics education. We combine these into a framework that encourage transformative discourse in introductory and intermediate statistics courses through application discussions alongside content learning.

“There is no more neutrality in the world. You either have to be part of the solution, or you’re going to be part of the problem.” - T. Siedner

Though the inclusion of social justice, equity, diversity and inclusion have been introduced in multiple disciplines and multiple classroom settings, little guidance is provided for incorporating such values into teaching Statistics in Higher Education. Additionally, social justice is part of organizations principles and ethics American Psychological Association (APA), (AERA), and American Evaluation Association (AEA) (AERA, 2021; APA, 2016; AEA, n.d.). Integrating social justice ensures statistics will benefit and respect the rights of all people and actively oppose unjust practices. Statistical education is at a precipice; determine if statistics will be part of the solution or be part of the problem. This article moves beyond the theoretical examination of social justice pedagogy to examine possible pedagogical actions. Hall and Murphy argue that curriculum can be thought of as being three levels: the specified curriculum, the enacted curriculum and the experienced curriculum (2008).

BACKGROUND

The current political atmosphere sparked by the death of George Floyd in May of 2020 and continuing with Anti-Asian sentiment, bring conversations of privilege and power to mainstream discourse, providing a catalyst to examine privilege and power in statistical instruction. The context of the moment cannot be lost and if now is not the time to examine the merging of social justice and statistics, then when? Privilege is power; both the ability to obtain services (“unearned advantage”) and power over others (“conferred dominance”) (Johnson, 2018). Privilege, power, and their impacts play an essential role in our lives. Conversations of privilege, power, and the impact on evaluation began in the 1970s with theories concerning evaluation’s subjective nature. Robert Stake is the first to coin the term “responsive evaluation” and “explicitly reject ‘preordinate evaluation’” (Christie & Alkin, 2013).

PROBLEM

We must examine how we as instructors, mentors, and citizens of the world have an impact on and responsibility forwarding social justice. We are biased individuals (Sellers, 2015), we see the world

through a specific lens and so do our students. Those lenses may not always be in alignment. The lack of alignment impacts how students learn and view our instruction. Research has suggested that teachers need to find ways to check students' understandings and how those understandings are influenced by prior and current experiences (Lee, 2011). Additionally, it is vital to relate the concepts and findings in research courses to areas familiar to students (Slayter, 2016). According to Martin and Nakayama "Most people, in fact, want to find the connections between what they learn in the classroom and what is occurring in contemporary society," (2018, p 89).

Classrooms are an intercultural space (Delante, 2020). Individuals from different cultures and backgrounds are coming together, interacting and communicating. As such, teachers need to be aware of possible miscues, miscommunications and social exigencies in communication that may happen along the way. This means that one form of communicating the material, is likely to be misunderstood and miscomprehended by one or more students. According to Delante, teachers must participate in rhetorical practices that pave the way for feedback and discourse (2020). The ability to adapt and relate to students' cultures are key to increasing students' knowledge.

When we come into teaching statistics, we believe that the dominant culture everyone must adapt to is Western Mathematics, however, when we do this, we ignore the cultural contexts of the instructor, students, and the world we live in.

DISCUSSION BOARD IN ONLINE CLASSES

Discussion boards allow for a collective space that develops new knowledge through "ways of knowing and ways of being in conversation" (Gunnlaugson, 2006, p. 2). Nonetheless, the efficacy of discussion boards is often questioned due to the quality of student engagement. We argue that with intentional and culturally relevant pedagogies, discussion boards can facilitate transformative discourse that deconstruct oppressive ideologies. Students can apply new statistical knowledge while discussing social justice issues by incorporating the Community of Inquiry framework (Vaughan & Garrison, 2006) and Singleton (2006)'s Courage Conversations framework. It is important to develop and maintain a teaching, social, and cognitive presence (Payne, 2021) in a safe online environment where students can speak their truth while accepting non-closure to conversations (Singleton, 2006).

Instructor Presence

The instructor's teaching presence guides the direction of the discussion boards. Therefore, it is important for instructors to be engaged, transparent, and committed to a space where discourse facilitates discomfort and learning. An introduction video can help students feel more personalized (Payne, 2021). It is always important to communicate the purpose of the online discussion boards as well as have a consensus on the norms of the space. The four agreements from Courage Conversations of staying engaged, experiencing discomfort, speaking your truth, and expecting as well as accepting non-closure can be a way to onset the conversation around norms. The instructor becomes a facilitator and checks in when necessary to foster that safe space for students.

Social Presence

A clear definition of social presence should also be communicated at the beginning of course and throughout the discussion. Students can be their authentic self within these online interpersonal interactions. The use of small discussion groups can create and maintain these relationships throughout the course. A level of trust and respect are built among members to discuss uncomfortable topics. The use

of storytelling (Payne, 2021) is a way to build rapport quickly and establish human connection. There will also be high engagement when students are able to speak their truth through personal and professional experiences. It is crucial for instructors to intentionally design and continuously communicate their goals for the online discussion boards for students' social presence to be authentic.

Cognitive Presence

Resources, questions, and activities should encourage a cognitive presence where critical thinking and courageous conversations are fostered. Media can stimulate students' interests while decreasing the use of heavy text (Payne, 2021). Videos, online graphics, and other data visualizations on social issues support students' understanding of statistics and data science to erode social injustices. There should be evidence of new knowledge, reflections, discussions, and confirmation of learning. Instructors can incorporate activities before each discussion that focus on the application of new knowledge through multiple perspectives. Discussion boards can be utilized as a reflection of the activity. The Courageous Conversations' compass is a resource that can engage students with new information with the believing, feeling, thinking, and doing quadrants (Singleton, 2006) in their discussion reflection.

Socratic questioning allows students to probe, encourage, empathize, and engage (Payne, 2021). This method allows students to ask for clarification, reasons, origin/source, and viewpoints of certain social issues to deepen the conversation and understanding. It empowers students to seek understanding of multiple perspectives through thoughtful discourse and weaving acknowledgement. Lastly, there should be a confirmation that learning. This can be any production from written reflections, media videos, or any other outlets.

Discussion boards become an effective instructional tool when instructors cultivate a space that challenges the Eurocentric concepts of statistics and data science through purposeful questions, deep reflections, and connections to injustices in our society. Below are several strategies to create an environment that fosters these courageous conversations around data science, statistics, and oppressive issues in our society.

UTILIZING SOCIAL JUSTICE TOPICS IN STATISTICAL APPLICATION

Statistics and Objectivity

Traditional mathematical courses are concerned with a type of data analysis in which the practices include the "planning, summarizing, and interpreting of observations of a system possibly followed by predicting or forecasting future events based on a mathematical model" (Mitchell, 2009, p 81). It is not surprising then that students have mixed responses and satisfaction with their courses (Slayter, 2016). The traditional method ignores discussions of differences, such as that of race (Mitchell, 2009). Hall and Murphy argue that curriculum can be thought of as being three levels: the specified curriculum, the enacted curriculum and the experienced curriculum (2008). Focusing statistical instruction on the specified curriculum or enacted curriculum, and ignoring the experienced curriculum means the curriculum is going to likely be ill fitting. It is fundamental to examine the relationship between curriculum, instructor, student and world (Hall and Murphy, 2008).

Statistics is taught from a western lens where white mathematicians are often quoted as great contributors of data science and numbers. They argued that data and numbers are unbiased and often

associated with objectivity. Yet, this perspective continues to reinforce Eurocentric ideologies that silenced marginalized perspectives. Louca (2009) wrote an article on how Francis Galton, Karl Pearson, and Ronald Fisher, all prominent figures in modern statistics, devoted their statistical work to eugenics and racism. Students can further read Evans' (2020) explanation of the contradiction between the argument of objectivity and statistics. After reading these two articles, students can either discuss these two discussion groups in their small groups or individual reflection. Their confirmation of learning can be sent as a zoom video, annotated article, or reflections in the discussion boards. This allows them to display their learning by answering two questions down below:

1. Using the Courage conversation compass, where are you with your reaction to the statement that statistics/numbers are objective?
2. If there is no true objectivity in statistics, how do we define principles of good data and conducting ethical data practices?

Racial Inequities in Descriptive & Percentiles

This global pandemic has increased people's awareness of the use of descriptive statistics and percentiles to understand the severity of an issue. Several government agencies and organizations have published numbers to illustrate a narrative for consumers. Students need to critically analyze how the use of descriptive and percentiles can highlight or conceal health inequities for various minoritized groups. One method is to foster these conversations through COVID tracker visualization. Students can select and discuss their interpretation of one of the publicly available COVID data illustrations. Afterwards, they can respond to the two questions down below that consider health equity considerations for ethnic minority groups:

1. What health narrative is highlighted by the data displayed in COVID tracker visualization? What health narrative is concealed?
2. What are the possible health inequity impacts for certain groups of people when a narrative is highlighted and/or concealed? How does this impact your work as a researcher/practitioner/educator?

Highlighting Group Inequities with Hypothesis Testing

A current debate that continues to dominate is that schools have inequitable school suspension practices for minoritized groups. One strategy to support students' understanding of this debate is through their application of several hypothesis tests. There are publicly available dataset from the Civil Rights Data Collection that can be provided to students. Students are asked to conduct either a t-test, anova, regression, chi square, and any other methods of hypothesis testing based on their district and group of choice. An example is using an ANOVA to understand the numbers of days Black, Indigenous, and Students of Color are in in-school suspensions as compared to white students for each school in that district. After they completed the activity, students will be asked to interpret the results and answer the questions down below.

1. In your opinion, do some schools reinforce racist ideologies in their suspension practices based on your statistical findings? Why or why not?
2. How might the results from your hypothesis testing reinforce oppressive ideologies?

CONCLUSION

We must be comfortable with discomfort. Excuses such as “social justice is covered in other courses,” or “there is too much other material to cover in the course,” ignore the risks of omitting a social justice lens in statistical courses. Failure to use a social justice lens risks “biased and otherwise incorrect conclusions” (Garlington et al., 2020). Rhetoric of instructors can justify a group’s exclusion or limited participation, further entrenching social injustices (Easterbrook, et al., 2018). While the inclusion of social justice with statistical methods helps make connections between data and addressing social injustices (Slyter, 2016). Though the melding of social justice and statistics may seem like a tall task “it takes courage to cut against the grain and become nonconformist. It takes courage to wake up and stay awake instead of engaging in complacent slumber” (West, 2018, p 635). Additionally, the recent work of Garlington et al. found social justice can be integrated into statistics courses with “relative ease” (2020).

REFERENCES

- American Education Research Association. (2021). *Social Justice*. [Www.aera.net](http://www.aera.net).
<https://www.aera.net/About-AERA/Key-Programs/Social-Justice>
- American Evaluation Association. (n.d.). *AEA > About > About AEA > Mission, Vision, & Values*.
 Www.eval.org. Retrieved June 21, 2021, from <https://www.eval.org/About/About-AEA/Mission-Vision-Values>
- American Psychological Association . (2016). Revision of Ethical Standard 3.04 of the “Ethical Principles of Psychologists and Code of Conduct” (2002, as amended 2010). *American Psychologist*, 71(9), 900.
- Christie, C., & Alkin, M. (2013). An evaluation theory tree. In Alkin (Ed.), *Evaluation roots: A wider perspective of theorists’ views and influences*, (2nd ed., pp. 11–57). Sage.
- Delante, N. (2020). Classroom teaching as an intercultural communication phenomenon: A thematic analysis of a foreign teacher’s rhetorical practices as communication dynamic. *Journal of Intercultural Communication Research*, 49(6), 536-568.
<https://doi.org/10.1080/17475759.2020.1790406>
- Easterbrook, A., Bulk, L. Y., Jarus, T., Hahn, B., Ghanouni, P., Lee, M., Groening, M., Opini, B., & Parhar, G. (2018). University gatekeepers’ use of the rhetoric of citizenship to relegate the status of students with disabilities in Canada. *Disability & Society*, 34(1), 1–23.
<https://doi.org/10.1080/09687599.2018.1505603>
- Garlington, T., Ryan, V. M., Nolty, C., Ilagan, H., & Kunicki, Z. J. (2020). Bringing Social Justice into the Statistics Classroom. *Teaching of Psychology*, 48(3), 269–274.
<https://doi.org/10.1177/0098628320979879>
- Hall, K., & Murphy, P. (2008). Introduction. In P. Murphy & J. Soler (Eds.), *Pedagogy and practice: Culture and identities* (pp. i–xiv). Sage.
- Johnson, A. G. (2018). *Privilege, power, and difference*. New York, NY McGraw-Hill Education.
- Lee, Y. A. (2011). What does teaching for social justice mean to teacher candidates? *The Professional Educator*, 35(2), 1–20.
- Martin, J. N., & Nakayama, T. K. (2018). *Intercultural communication in contexts*. McGraw-Hill Education.
- Mitchell, R. (2009). “Soft Ears” and hord topics: Race, disciplinarity, and voice in higher education. In A. Y. Jackson & L. A. Mazzei (Eds.), *Voice in Qualitative Inquiry: Challenging conventional, interpretive, and critical conceptions in qualitative research* (pp. 77–95). Routledge.
- Payne, A. L. (2021). A resource for E-moderators on fostering participatory engagement within discussion boards for online students in higher education. A practice report. *Student Success*, 12(1), 93-101. <http://dx.doi.org.aurarialibrary.idm.oclc.org/10.5204/ssj.1865>
- Sellers, R. M. (2015, May). Why should psychological science care about diversity? *Colloquium*

- presented at the annual meeting of the Association for Psychological Science, New York City, NY, United States.
- Singleton. (2006). *Courageous conversations about race: A field guide for achieving equity in schools*. Thousand Oaks, CA: Corwin.
- Slyter, E. M. (2016). Teaching note—"by any means necessary!" infusing socioeconomic justice content into quantitative research course work. *Journal of Social Work Education, 53*(2), 339–346. <https://doi.org/10.1080/10437797.2016.1237912>
- Louçã, F. (2009). Emancipation through interaction - how eugenics and statistics converged and diverged. *Journal of the History of Biology, 42*(4), 649-84.
doi:<http://dx.doi.org.aurarialibrary.idm.oclc.org/10.1007/s10739-008-9167-7>
- Evans,R. (2020, July 28th). RA Fisher and the science of hatred. Science-Tech.
<https://www.newstatesman.com/international/science-tech/2020/07/ra-fisher-and-science-hatred>
- West, C. (2018). Courage. In M. Adams, W. J. Blumenfeld, D. C. J. Catalano, K. "Safire Dejong, H. W. Hackman, L. E. Hopkins, B. J. Love, M. L. Peters, D. Shlasko, & X. Zuniga (Eds.), *Readings for Diversity and Social Justice* (pp. 635–637). Routledge.