Diversity Infusion Project: Assessment
MSM/MBA 567: Analytics I: Quantitative Methods
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Project Summary

The goal of this project was twofold. First, as Bell et al. (2008) describe, the extensive body of research linking greater diversity in the workplace to organizational success is largely not included in management programs. In short, there is a missed opportunity in regards to management curriculum – there is an abundance of empirical evidence supporting the benefits of workplace diversity; however, this research is typically not shared with management students who will most likely make future human resource decisions in which diversity is a factor. Second, by incorporating diversity-related data sets into the course, we enhance the pedagogy of the course. Most MBA and MScM students have not worked extensively with cross-country or firm level diversity data and are unlikely to have *a priori* expectations about what the analysis results 'should' reveal. Thus, by requiring the students to work with unfamiliar data, they not only need a solid understanding of the analysis technique and the underlying assumptions, but they are also challenged to question and interpret their results.

We created three different diversity-related projects that were distributed at the beginning, middle, and near the end of the course (provided in the Appendix). The projects varied in the type of data used; from micro, firm-level data to macro, country-level data. Each project required students use a different set of analyses to address the questions posed. Further, the students were required to review some of the literature linking greater workplace diversity to organizational success and to use these readings (of their choosing) to support the projects' empirical results. When we handed out the projects we discussed the rationale for diversity-themed projects, and when we collected the projects we talked about the findings. Specifically, we asked, "What results surprised you? What did you find most interesting and why? And, what did the research say to support or contradict what you found?"

Assessment Results

<u>Student Feedback</u>

At the end of the course, we added two questions to the SPoT evaluations.

1. This course enhanced my knowledge of how statistics can be used to describe and/or analyze a variety of issues related to diversity.

2. The projects in this course enhanced my awareness of a variety of issues related to diversity both at the country level and at the more micro, firm level.

	DiRienzo	**Platania**
Question 1	*Avg.:* 4.75 (5 point scale) *St. Dev.:* 0.55 *n*: 20	*Strongly Agree*: 4 *Agree*: 1 *Somewhat Agree*: 1
Question 2	*Avg.:* 4.53 (5 point scale) *St. Dev.:* 0.77 *n*: 19	*Strongly Agree*: 4 *Agree*: 1 *Somewhat Agree*: 1

Overall, the student responses to the SPoT questions were exceptionally positive and offer evidence that the project was successful from the student perspective. Nonetheless, we both felt the stronger evidence stemmed from the quality of the student projects and the class discussions. In both of our courses, the students submitted some of the highest quality work we have seen in several years; the students clearly grasped the importance of the topic and put considerable effort into their analyses and reports. The overwhelmingly majority of students submitted papers that were carefully constructed and considered the assumptions behind the tests. Further, in class discussions, several students raised very relevant questions about the assumptions behind tests for discrimination at the workplace and were eager to share what they learned from their readings. From a statistical perceptive, this kind of enthusiasm is (ironically) hard to quantify, but we both feel speaks even more strongly than the SPoT results. In sum, in two different classes we both felt that the students valued the discussion and coverage of the benefits of workplace diversity. Further, the demographics of the students varied significantly in the two classes; the one taught at Elon was largely a homogeneous group and the one taught in RTP was considerably more diverse. We found it interesting that both the 'non-diverse' and 'diverse' groups responded with the same level of interest and enthusiasm for the topic.

<u>Our Feedback: What worked and what could be improved</u>

In regards to 'what worked' we are both very pleased with the quality of the diversity projects we created. It is very difficult to obtain real world diversity data and, what is available is typically not well-suited for the analyses taught in our course. Providing our students with high quality, real world diversity data that can be used to test the analyses covered in class is a significant 'win'. These projects also work to close the curriculum gap and help our management students gain a greater awareness of the value and relevance of workplace diversity.

In reference to improvement, we both struggled with transitioning from the course subject matter to diversity related classroom discussions. The course material is very quantitative in nature and class discussions tend to be explanations of analyses. In other words, the course content is more mechanical and does not easily lend itself to more qualitative, 'softer' discussions. Further, the appropriate length of time dedicated to the diversity-related discussions was difficult to gauge. Considering that we did not have other dedicated in class discussions of other topics, determining what felt like the 'right' amount of time was challenging. We did not want the students to perceive the coverage of diversity topics to be forced or incongruent with the course material and finding the appropriate time to dedicate was somewhat of a struggle. We believe that some of these challenges will improve with more time and experience. Finally, we both felt unprepared for a negative student response to the projects / diversity coverage. For example, a student taking an anti-diversity / inclusion position in a class discussion. Thankfully, our students responded very positively and enthusiastically to the assignments and classroom discussions, but having 30 plus years teaching experience between the two of us, we know this will not always be the case. Thus, learning best practices regarding how to handle such situations in a graduate classroom is something we will need to research.

Sharing our Results

We plan to share our DIP project at our department retreat this August. Our objective will be to inform others in our department about the DIP grant process, discuss our experiences, and encourage others teaching statistical methods courses to consider using the diversity data sets and/or projects we have developed. It is our hope that sharing this with our department in an informal way will promote dialog about infusing diversity into more of our classes and, perhaps encourage others to apply for a DIP

grant. Finally, we will share our work with the new faculty coordinator of the MBA-MScM programs (faculty member to be named). When the new coordinator is in place, we will share our work from an assurance of learning perceptive and ask that we are put on the agenda for the next MBA-MScM faculty meeting such that we can discuss our work with other faculty teaching in the program – especially those teaching in the analytics track.

Bell, M.P., Connerley,M.L., and Cocchiara, F.K. (2008). "The Case for Mandatory Diversity Education," *Academy of Management Learning and Education,* Vol. 8, No. 4; pp. 597 – 607.

Appendix

Project #1
Fall 2016
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The Diversity Data set (on Moodle) contains the ethnic, linguistic, and religious fractionalization values for 180 countries. The data set was calculated by Alesina et al. (2003) and the fractionalization value measures the degree of diversity for each of these three factors within each of the countries. As an example, for Afghanistan, the ethnic, linguistic, and religious fractionalization values are 0.7693, 0.6414, and 0.2717, respectively. This means that if two Afghani citizens were *randomly* selected from the population of all Afghani citizens, there is a 0.7693 probability, or 76.93 percent chance that the two randomly selected citizens will be of a different ethnic background. Further, there is a 64.14 percent chance that they would speak different languages and a 27.17 percent chance that they would have a different religious affiliation. In other words, the closer the fractionalization index is to 1, the greater the diversity. Included in this data set are qualitative variables for each of the continents that are represented in the data. The variables take a value of 1 if the country is located on that continent and a 0 otherwise.

Use this data set to do the following:

1. Create a report of the descriptive statistics of the diversity data. In this report, include the following information for *each of the three* diversity measures:
    - mean, median, and mode
    - sample standard deviation and coefficient of variation
    - measures of skew (note if positive, negative, or symmetric)
    - note any outliers (assume a normal distribution for now)
    - histograms (one for each of the diversity measures)
    - a scatter diagram *and* correlation measures of each unique pair of diversity measures (ethnic and linguistic, ethnic and religious, and linguistic and religious)

2. Pick one of the continents and report the same statistics as above and compare the descriptive statistics from the continent you selected to the entire data set.

3. Select <u>one</u> of the following questions to answer. Be sure to cite at least five academic sources in your response.

    - In reference to human resources and management, what are some of the benefits and challenges of having a diverse workforce? What are some of the best practices or strategies to harness the benefits of a diverse workforce?

    - In reference to marketing, what are some of the challenges of having a diverse consumer base? What are some best practices or strategies to address these challenges?

Alesina, A., Devleeschauwer, A., Easterly, W., Kurlat, S., and Wacziarg, R. (2003), "Fractionalization," *Journal of Economic Growth,* VIII: 155-194.

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Case #2
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Diversity in the workplace is becoming an increasingly important topic in Human Resource Management. In Case #1 in this course you reviewed some of the research on both the benefits and challenges of having a diverse workforce. It has been shown that organizations employing a diverse workforce can supply a greater variety of solutions to problems in service, sourcing, and allocation of resources.

However in many industries, diversity in the workplace has been slow to come. Companies in the Silicon Valley in particular have been long criticized for being comprised almost entirely of white men. In response to their critics, in 2014 a number of the largest technology companies for the first time began to publish their employee demographic data. The numbers confirmed the critics' fears. Minorities accounted for just a small fraction of most of the companies' workforces, and in terms of gender diversity, *no* company could say that women made up 50% of its employees.

The direct application to this course is of course that statistics plays an important role in legal cases of discrimination. The courts have generally established that racial discrimination may be demonstrated with one of two statistical methods: "comparing the proportion of minority applicants who are hired to the corresponding proportion of majority applicants (applicant flow method); or comparing the percentage of minorities currently employed or hired over a period of time to the proportion of minorities in the labor force (or population) in the relevant geographic area (demographic method). To complicate matters however, these different methodologies often yield very different statistical results. The interactive website http://money.cnn.com/interactive/technology/tech-diversity-data/ contains data on the percentages of minority employees for various positions at five (5) large Silicon Valley companies. U.S. labor force statistics by gender and race can be found at: http://www.bls.gov/opub/reports/race-and-ethnicity/2015/home.htm (I would think among other things, Table 1 under 'Composition of the Labor Force' would be helpful here). Using this data, conduct a statistical analysis to determine the following. Be sure to explicitly state the hypotheses you are testing along with your conclusions.

1. Is there any statistical difference in the proportion of race minorities (defined as "non-white") hired across any of the companies included in the dataset? That is, is the proportion of racial minority employees equal across all of the companies included in the dataset? What about gender minority?

2. Using the demographic method described above, determine whether there is evidence of either racial or gender discrimination for any of the companies included in the dataset. To do this, you will need to conduct a separate analysis for each company to determine if there is a statistical differences in the overall proportion of minorities (racial or gender) employed in that company as compared to the corresponding proportion of minorities in the overall labor force.

3. Using a similar methodology as in question (2), determine whether there is evidence of either racial or gender discrimination at the management level for any of the companies included in the data. Note that "management" should include employees in either Manager or Mid-Level Manger positions. Data on U.S. employment by position can be found at: http://www.bls.gov/cps/cpsaat11.htm

4. Based on the results of your analyses above, discuss your overall findings/conclusions regarding the extent of workplace diversity in these Silicon Valley companies in a 1-2 page (double-spaced) report. The format of this report should be business professional.

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Case #3
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Regression analysis is frequently used to test for wage discrimination at the firm level. The Employee Data set (on Moodle) contains the employee data from Firm ABC. Specifically, the data set contains the salary, years of experience (at Firm ABC), last year's annual performance rating*, years of education past high school, a dummy that takes the value of 1 if the employee is in a management role, a dummy that takes the value of 1 if the employee is female, and a dummy that takes the value of 1 if the employee is non-white. Estimate the following regression (where *y* is salary) and answer the questions that follow:

$$y = \beta_0 + \beta_1 Exp + \beta_2 Perf + \beta_3 Ed + D_1 MGT + D_2 Gender + D_3 Race + \varepsilon$$

1. What variables significantly affect an employee's salary at Firm ABC?

2. Is there any evidence of gender or racial discrimination at Firm ABC?

3. What about the model assumptions? Are there any concerns?

4. Finally, there is a concern that female managers at Firm ABC earn less than male managers, all else equal (which means assuming the same years of experience, performance rating, and education level). Use regression analysis to test if there is statistical evidence of this kind of discrimination. Hint: You will need to add a dummy interaction term to the regression above…you want to know if MGT*Gender matters.

*The annual performance rating is based on a possible score of 1 (worst possible employee performance) to 10 (best possible employee performance). The scores are given each year with the employees' performance reviews.