Undergraduate Student Satisfaction Factors

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ABSTRACT

In this project, we wanted to explore the regrets of former college students. As our initial search for data began, we found a more interesting topic to be the satisfaction of undergraduate students. In this paper we ask, *What factors contribute to undergraduate life satisfaction?* It was from here that we were able to use a dataset found on Kaggle [1] where we had to filter through data to find points of interest. Our primary factors that we chose to focus on in this design process was the year of study, primary program, gender, department of study, housing type, how many events a student has participated in, stress levels, effort made to interact with others, and satisfaction levels. It is here that we filtered data and looked at the different relationships between the factors above. What we found was quite interesting in that many factors contributed to the satisfaction of undergraduate student life.

1 INTRODUCTION

When students walk across the stage after four years of grueling all-nighters and thousands of dollars, will they be satisfied with their experience? Will college be all that it was promised to be culturally, socially, and economically? What factors make or break a student's time in college and can we catch them now so that all students can start living more satisfying college experiences before it's too late and they're already walking across that stage? This study aims to shed light on data regarding undergraduate life satisfaction by exploring the singular question, What factors contribute to undergraduate life satisfaction? With the attempt of a holistic and well-rounded approach, this will focus on analyzing different factors separated into three different groups (and iterations). First comes a birds eye view of students. From a person's program (i.e. major), gender, and year can any relationships and correlations with satisfaction be found? Then from a more detailed look, departments and housing types are evaluated. And finally to close off on a deep level, important factors like students' stress levels, amount of interaction, and participation are analyzed.

2 RELATED WORK

Using our initial research about the regrets of college students we found it very interesting that only about ⅓ of college graduates did not experience regrets [6]. As we looked further into this article by Dana Wilkie, we also noticed that as we went from Boomers to Gen X to Millenials that the percentage of people with no regrets from college was getting lower and lower and the percentage of people that regretted their student loans kept increasing [6]. To go even further, we saw an interesting distribution of different majors regretting their student loans with Health Sciences being the largest[6]. While this interest in the differentiation between majors was

interesting to us we did not see the questions they were asking as something that we were highly interested in. Instead we decided to switch our question to ask *what are contributing factors to student satisfaction?*

Our research question is not entirely new to the table. Though Felice Billups may have used different data than us, his paper *Measuring College Student Satisfaction: A Multi-Year Study of the Factors Leading to Persistence* addresses this same question and speaks to the likelihood of students staying and completing school [2]. As F.-Sophie Wach states in her article, it is well known that student satisfaction impacts academic performance of students, but little is known about the factors that actually contribute to the satisfaction of students [5]; this is what we wanted to explore. Billups states that many times institutions measure student satisfaction levels through surveys [2]. This is an interesting point because from personal experience we found that not many students participate in these surveys, so we may not actually be looking at a very comprehensive approach.

Based on the understanding of using student satisfaction surveys (like the data we obtained) we found that at Penn State about 67-97% of students participated in activities [3] a potential area that we might consider looking into. We also looked into some statistics at CU and found quite a few different student surveys all pertaining to different things. The most intriguing questions we found were:

- How satisfied are seniors with their educational experiences at CU Boulder, and what are their after-graduation plans?
- What factors may influence students' decisions to leave CU Boulder?
- How engaged are first-year and senior students in their studies and other educationally purposeful activities?
- How do undergraduate students experience the social climate at CU Boulder?
- To what extent do CU Boulder students experience sexual misconduct?

All these research questions helped to determine the questions that would be asked to students during each of these different surveys [4]. We employed our research when we developed our methods and chose the areas of focus we found to be most relevant and intriguing.

3 METHODS

In this project we took data found from Kaggle [1] and cleaned the data by eliminating the factors (columns) that we decided not to focus on. We eliminated these columns because research and personal experience dictated that these were not going to be huge areas of contention in terms of really seeing a difference in satisfaction levels. From here we started off with a first iteration that focused on gender, primary program, and year and how they relate to student satisfaction; iteration two focuses on department type and housing type in relation to student satisfaction; and iteration three focuses on more self-reported and subjective factors that affect student

satisfaction such as stress levels, interaction efforts with others, and participation at events. We found it important to test external factors that define the basic make-up of a student portfolio and socio-economic status, as well as including subjective factors that help to reflect student mindsets and how they relate to satisfaction levels.

3.1 ITERATION I

In Iteration I, we explored gender, primary program, and year of study in relation to student satisfaction. Here we focused on answering the questions *Which areas of constant discourse (gender, program, and year of study) in academic performance affects the mental outlook of students in terms of satisfaction and stress?* Here we created multiple bar graphs each with one of the different demographic focuses listed above in relation to student satisfaction. We chose year of study as it reflected the experience level of students in the institution at this point and the results would also allow for reflection on student mindset. We chose gender to focus on as it pertains to many other studies that focus on the demographic differences in departments and fields chosen between men and women (for example computer science is consistent of approximately 20% female) [6]. We also focused on programs of study due to the statistics shown on different programs having different stress or anxiety levels and the discourse of stem majors versus liberal arts majors that stem from the standards of universities. While this was our main point, there were additional visualizations conducted in order to further explore, specifically the satisfaction vs. stress levels of students divided into their different programs.

3.2 ITERATION II

Within Iteration II, we focused on the question *Does housing type and department (e.g. School of Business, School of Law) impact student satisfaction?* To start out we took the data's 2,500+ respondents and sorted them by department. Then by getting the average satisfaction rating of each department, we were able to create a bar graph that exposes trends between departments. From the housing perspective, we did something very similar but added an additional level of interaction. On a high level viewers are given context with an overall bar graph depicting the mean satisfaction of respondents in each of the four housing types: Halls, Out of Campus, Residents, and Residential Colleges. From there users can delve further into housing type specific data they wish to learn more about by clicking on one of the gray bars, this transforms a different (but linked) bar graph where they can see all of the students of that housing type's mean satisfaction levels broken down by department (*Figure 3*).

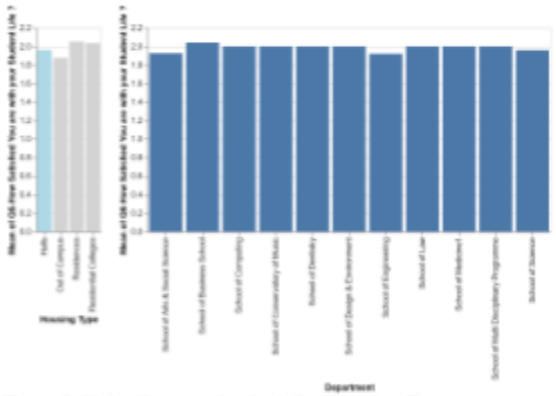

Figure 3: Linked bar graphs depicting Housing Type vs. Department vs. Average Satisfaction

3.3 ITERATION III

And finally, in Iteration III we looked further into the more internal and personal factors of a student's life: stress levels, interaction (measured using an ordinal scale), and participation (measured by the amount of events they participated in). With this type of data we were able to utilize the simplicity of line graphs more and focus on trends across change. We started out with two line graphs. For our first line graph our y-axis was mean student satisfaction (since it's the dependent variable) and we wanted to measure that in relation to interaction so interaction was our x-axis. We did a similar idea for our second line graph but changed the x-axis to the amount of events they participated in.

Afterwards so that users could see how all of these different factors play into each other we created a couple of scatter plots. In our first scatter plot the y-axis was still mean satisfaction level, however our x-axis was stress. And to incorporate the interaction and participation measures we talked about earlier, size was interaction and color was mapped to participation. In this way users can interpret the points by asking questions like, *Are my larger (indicating interaction) and darker (indicating participation) points also higher up(more satisfied)?* And our last visualization for this iteration built off of the data we found and asked the question, does more participation in events increase stress? How does that impact overall undergraduate satisfaction? And this is where our second scatter plot came in where the x-axis corresponds with participation, our y-axis corresponds with stress levels, and color is mapped to overall satisfaction.

4 RESULTS

All in all while we did look at results from many different areas of life, there was a lot of cohesiveness in how all of these different factors of one's college experience impacted each other. From Iteration I we discovered that gender didn't have as much of an impact on satisfaction as much as year did, and even year's impact on satisfaction didn't measure up to how important stress is! We were a little surprised to find that no stress is actually not the goal, but small amounts are. Iteration II built on that and found that Department and Housing Type also played a role in student satisfaction (but still not as much as stress!). Interestingly, Housing Type had more of an impact on stabilizing/destabilizing people's scores rather than increasing or decreasing them. And finally to wrap it up Iteration III uncovered some areas of interest that are around as influential as stress! In this final stage we discovered that one's pursuit of itneration with others is also vital to a complete and satisfying college experience and that events can cause more stress when not done in moderation with this goal in mind. All in all, these results have really helped shed some light on *priorities*. A lot of factors go into one's overall college satisfaction level but it showed us that students should focus on moderating their stress and seeking interaction with others above most other aspects studied here.

4.1 ITERATION I

In the first iteration we discovered two very significant and interesting findings. The first is that students who have spent more time at the university had significantly higher satisfaction rates than those that had just started out (*Figure 1*). According to personal experience, this is most likely due to the fact that those who are older and in the process for a longer time have already established a certain lifestyle and routine. Additionally, third years on average have the lowest satisfaction rate than any other year. The reasoning behind this is still unknown, but there are many possible explanations.

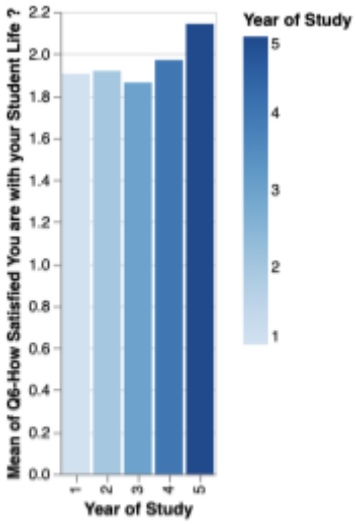

Figure 1: Average satisfaction level for each year of study

The second thing that we found was in the satisfaction vs. stress breakdown (*Figure 2*) where we discovered that no stress yielded the least amount of satisfaction and high stress led to the second lowest satisfaction scores. Through this visualization we found that moderately low stress levels yield the highest life

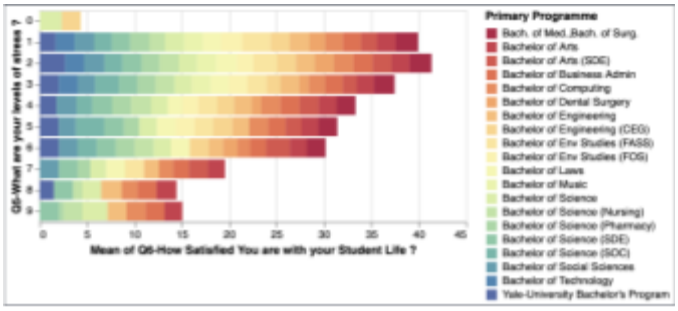

Figure 2: Average Student Satisfaction vs. Student Stress levels broken down by Primary Program

satisfaction amongst students. The group that is part of the highest satisfaction level has a stress level of two and a satisfaction level above 40. The program that contributes the most to that satisfaction level is Yale Universities Bachelor's Program with a Bachelors of Medicine and a Bachelors of Surgery closely following.

4.2 ITERATION II

In Iteration II we discovered a lot about all the departments in general but also about which departments stood out the most. Our first visualization which was a bar graph was quick to validate our earlier findings and show that those in the School of Medicine had the highest average satisfaction level (~2.1). But we also learned that in context, it wasn't much higher than its runner ups. The Schools of Music, Lifelong Education, and Foreign Studies came in close at second with a score of around 2.0. And finally there was a strong outlier, the School of Dentistry, which had a very low average satisfaction score of slightly above 1.6 (*Figure 4*).

Our second visualization provided a lot of

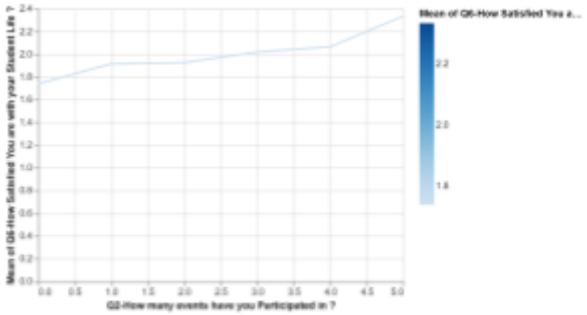

Figure 5: Number of Events Participated In vs. Average Satisfaction

insight regarding the ranges of mean satisfaction levels across the different housing types. For those respondents who lived in a Hall, there was a very uniform average satisfaction level of about 2.0 almost completely across the board! All of the other housing types (Out of Campus,

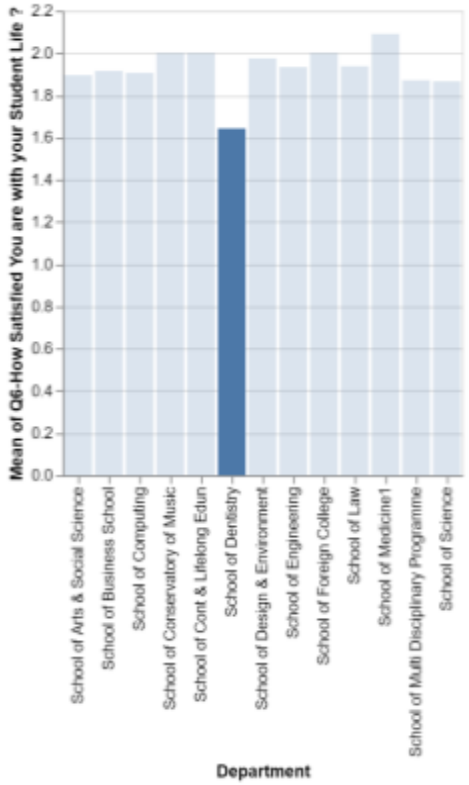

Figure 4: Average Satisfaction of Each Department

Residences, and Residential Colleges) had much more variation in their mean satisfaction scores when broken down by department. Additionally, this visualization was able to show us that the "Out of House" type of housing was the most diverse in the amount of departments it encompassed (13 total). On the other hand only people from 7 different departments self-reported themselves as part of the "Residents" housing type. All in all, housing type didn't seem to have a correlation with overall satisfaction levels, but rather a correlation with how much *variation* there is between the satisfaction levels that are within each housing type.

4.3 ITERATION III

According to our first two visualizations, we can see that there is in fact a positive correlation between overall undergraduate satisfaction, interaction, and participation. Our data focused on interaction had a larger range but a less steep slope. Respondents who rated their participation level within 1-2 (on a scale of 0 to 5) only had a around a 0.01 difference in satisfaction score (*Figure 5*). Additionally, there was a much stronger relationship between interaction (and the respondents' self-reported level of effort put into interacting with others) and satisfaction levels rather than participation (and the number of events one attended) and satisfaction levels. And from the stress perspective, those that were the most satisfied had a mean stress level of 2.0-3.5 (out of a scale from 0 to 9). More event participation actually didn't strongly correlate with more satisfaction, but it did correlate with more stress (except for a sudden outlier at those who participated in 5 events and only had an average stress

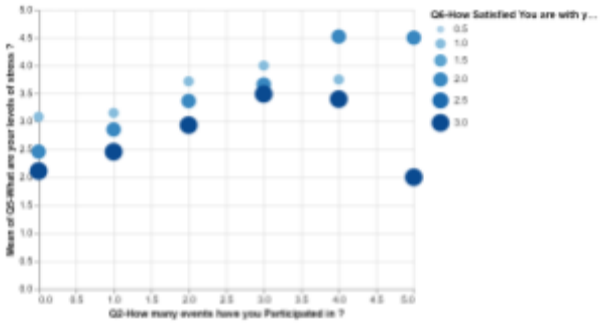

Figure 6: Event Participation vs. Stress Level (color = Satisfaction)

level of 2) (*Figure 6*). This data indicates that it's all about finding that balance of more than 0 events (to get that increased interaction with others) but a small enough amount so stress won't increase too much.

5 DISCUSSION

After looking further at data surrounding all of these different factors and seeking to find which impact undergraduate satisfaction, we've found that factors from a multitude of different areas of life all come together and contribute in their own ways. Some factors like stress level, the amount of effort one puts into interacting with others, primary program, and department definitely had a strong say in one's overall undergraduate experience. But the others like housing type, event participation, and year all contributed in their smaller and less defined ways. And finally, there were some variables like gender which had virtually no significant impact on overall undergraduate satisfaction. In light of this, there are so many more ways this research could go. One significant way to take this research further would be investigating the impact of COVID-19 on undergraduate satisfaction (it definitely brought with it a unique housing type of it's own!). Additionally, looking further into the variables that we found were impactful, like stress levels. That means asking deeper, thought provoking questions such as:

- What are the biggest causes of stress?
- Does having interactions with others impact or alleviate stress in a statistically significant way?

All in all, this data has been a great opportunity to single out opportunities where undergraduate students can really focus their efforts by learning from the experiences of 2,500+ other students who have walked their path before.

ACKNOWLEDGEMENTS

[1] Shivam Bansal. 2019. Ideal Student Life Survey. (January 2019). Retrieved May 4, 2021 from https://www.kaggle.com/shivamb/ideal-student-life-survey

[2] Felice D. Billups. 2008. Measuring College Student Satisfaction: A Multi-Year Study of the Factors Leading to Persistence. (October 2008). Retrieved May 4, 2021 from https://scholarsarchive.jwu.edu/highered/5/

[3] Anon. Student Experience Survey. Retrieved May 4, 2021 from https://studentaffairs.psu.edu/assessment/analysis-reports/student-experience-survey

[4] Anon. 2019. Undergraduate Student Surveys. (October 2019). Retrieved May 4, 2021 from https://www.colorado.edu/oda/surveys/oda-sponsored-surveys/undergraduate-student-surveys

[5] F.-Sophie Wach, Julia Karbach, Stephanie Ruffing, Roland Brünken, and Frank M. Spinath. 2016. University Students' Satisfaction with their Academic Studies: Personality and Motivation Matter. (January 2016). Retrieved May 4, 2021 from

https://www.frontiersin.org/articles/10.3389/fpsyg.2016.00055/full

[6] Dana Wilkie. 2019. Many Grads Have Regrets About College. (August 2019). Retrieved May 4, 2021 from https://www.shrm.org/resourcesandtools/hr-topics/employee-relations/pages/college-regrets-.aspx

[7] Anon. 2021. Women in Computer Science. (April 2021). Retrieved May 4, 2021 from https://www.computerscience.org/resources/women-in-computer-science/