Data Exploration Project Memo - Student Adaptivity to Online Learning

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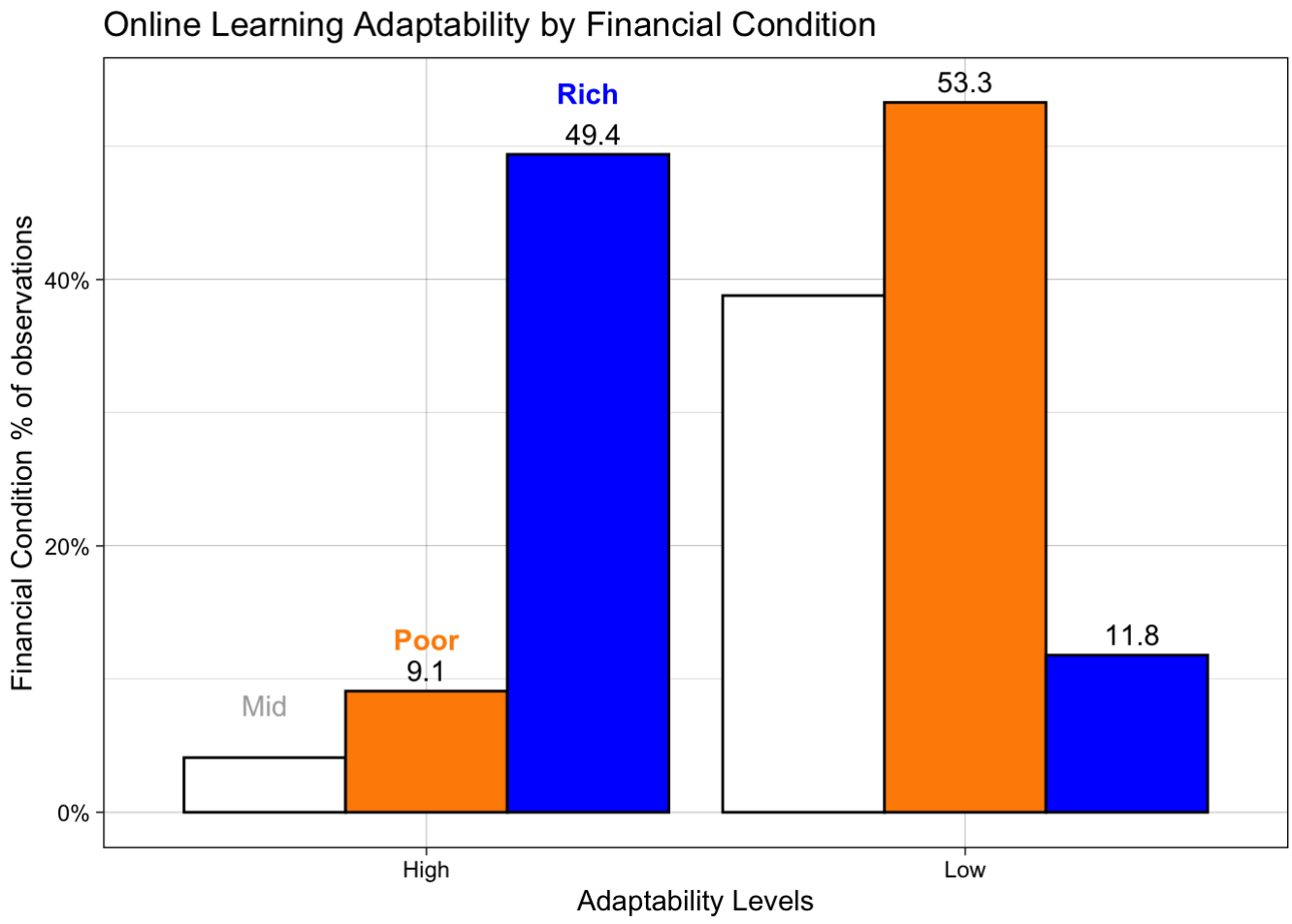
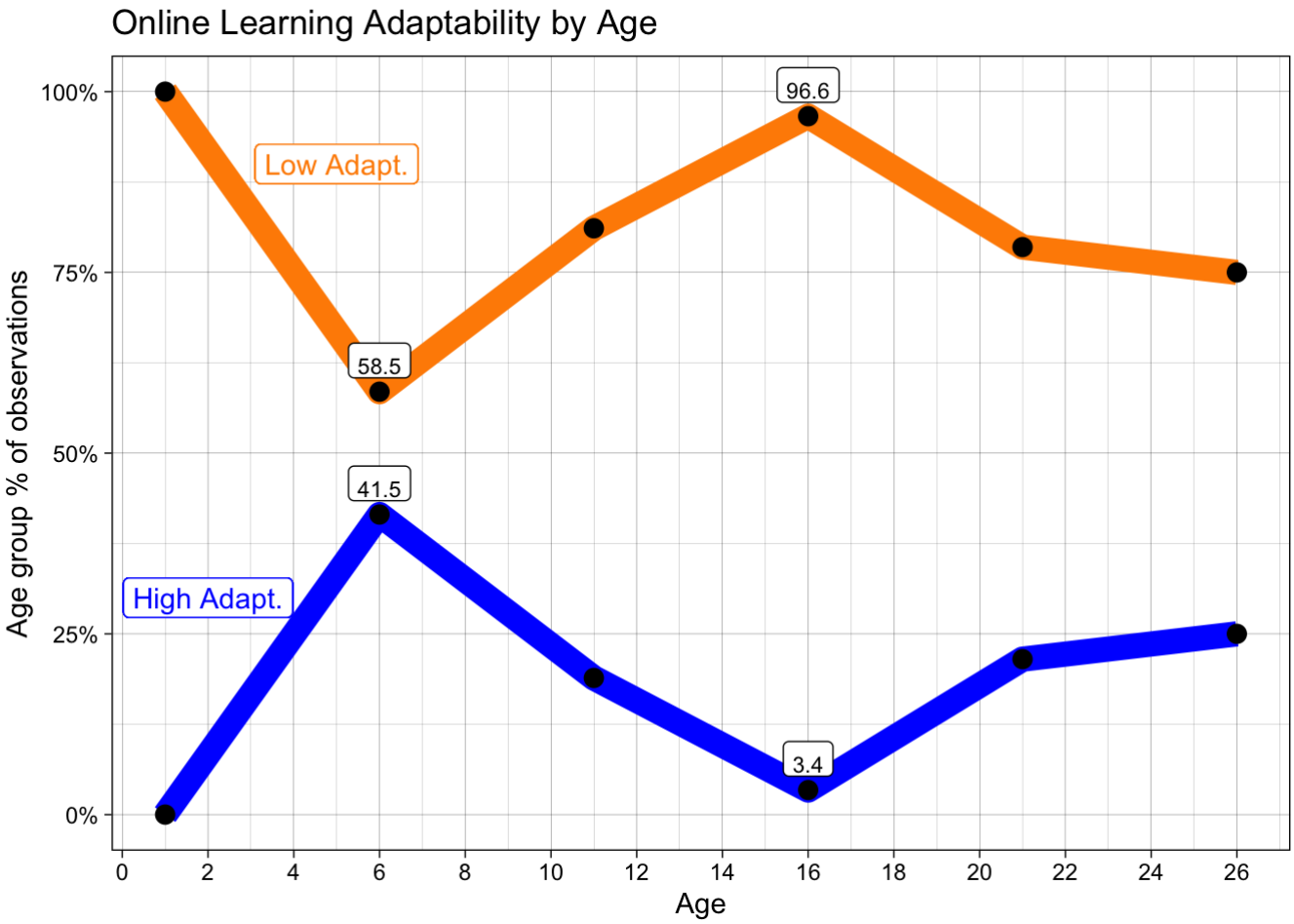
As current university students who spent a large proportion of our undergraduate years learning from home during the COVID-19 pandemic, our group was particularly interested in exploring a data set about student performance during this time and the unique challenges imposed on students by at-home learning. The set data that we explored was made up of student observations collected from December 10, 2020 to February 5, 2021 in Bangladesh, and consisted of several variables describing the adaptability level of students to online learning during the pandemic. The main variables that we chose to focus on in our exploration included the duration of class time per day, duration of class time per day, education level of the students, and financial condition of the students.

We decided to explore the relationships between these different variables and determine which factors play the largest role in a student's ability to succeed in an online learning environment, described in the data as their "adaptivity level"- a ranking based on the students' reports about how well they considered their online education to be going. The first variable considered was the students' financial condition, based on the relative wealth of their family or primary source of financial support.



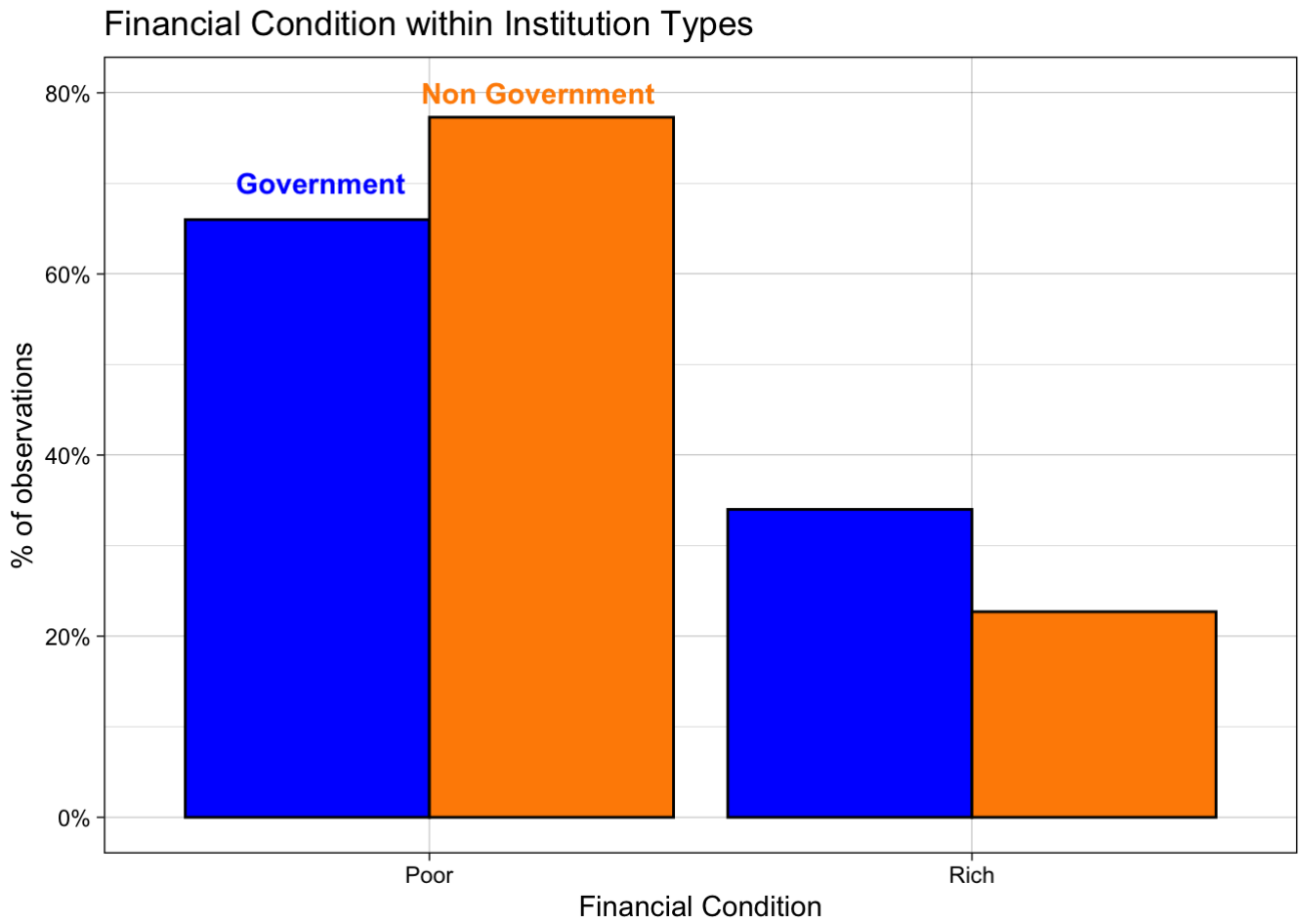
There is significant disparity among wealthy and poor students in their adaptivity to online learning, with roughly half of wealthy students falling into the high adaptivity category, compared to less than one-tenth of poor students. This indicates that financial condition plays a very large part in determining a student's success in an online learning environment, perhaps more than any other factor considered. Despite global efforts to ease the financial burden of the COVID-19 pandemic, it seems that low-income individuals suffer the brunt of these consequences in pursuing their education.

The next variable considered was students' age ranges and level of adaptability.



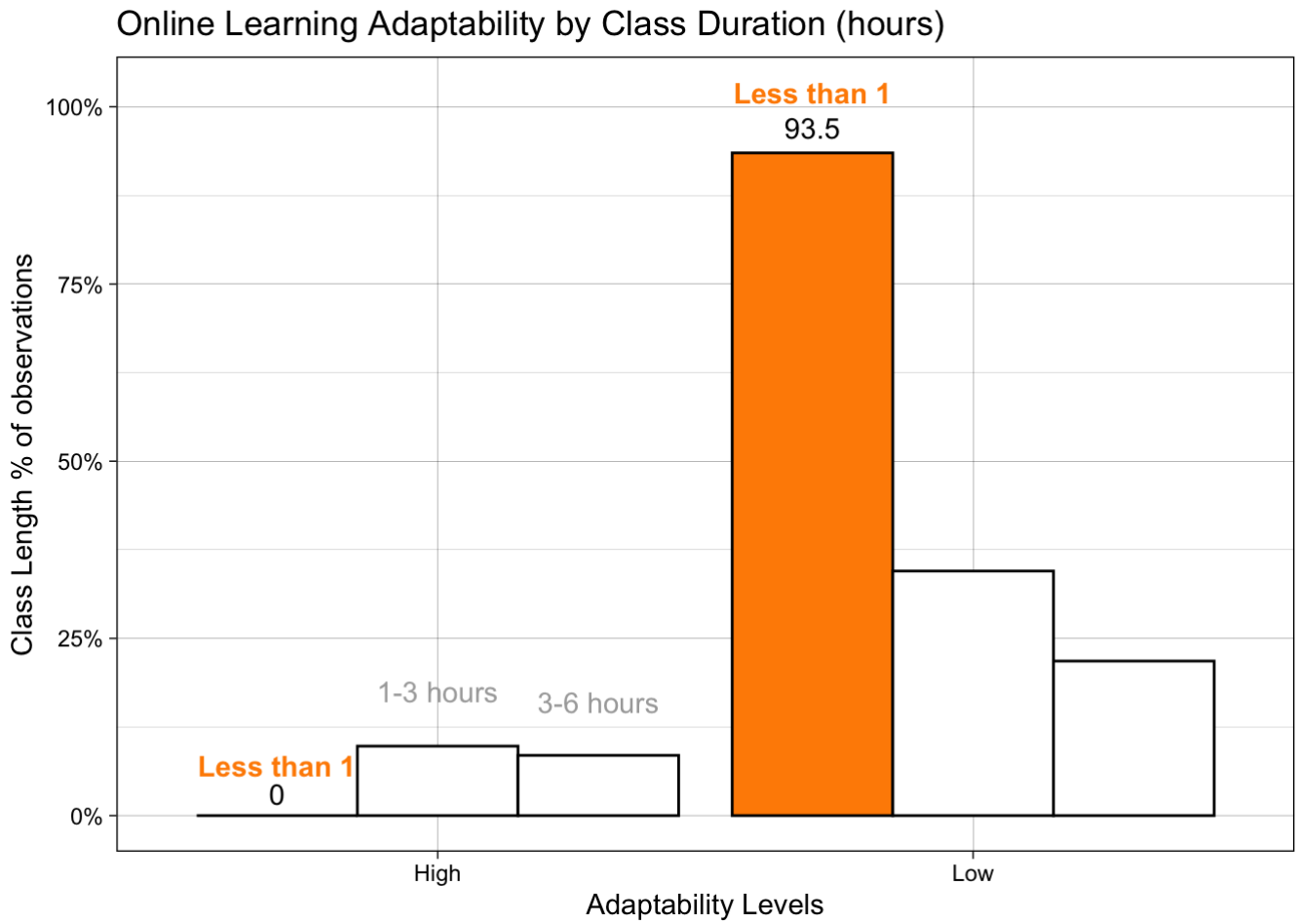
In general, disparity in adaptivity level dramatically increases around age 6, and peaks around age 16 before slowly receding past the age of 20. This could be related to students' access to resources at this age, but could also have to do with the fact that higher education is typically pursued by a smaller, more privileged group of students who might have more similarities in the other factors that determine adaptivity. Regardless, it is important to consider that students in the specified age range have the largest gap in adaptivity, and students in their mid teens have the highest rate of low adaptivity among students surveyed.

To see how much of this difference in financial condition is related to the public or private status of the schools, we considered the relationship between student financial level and type of institution



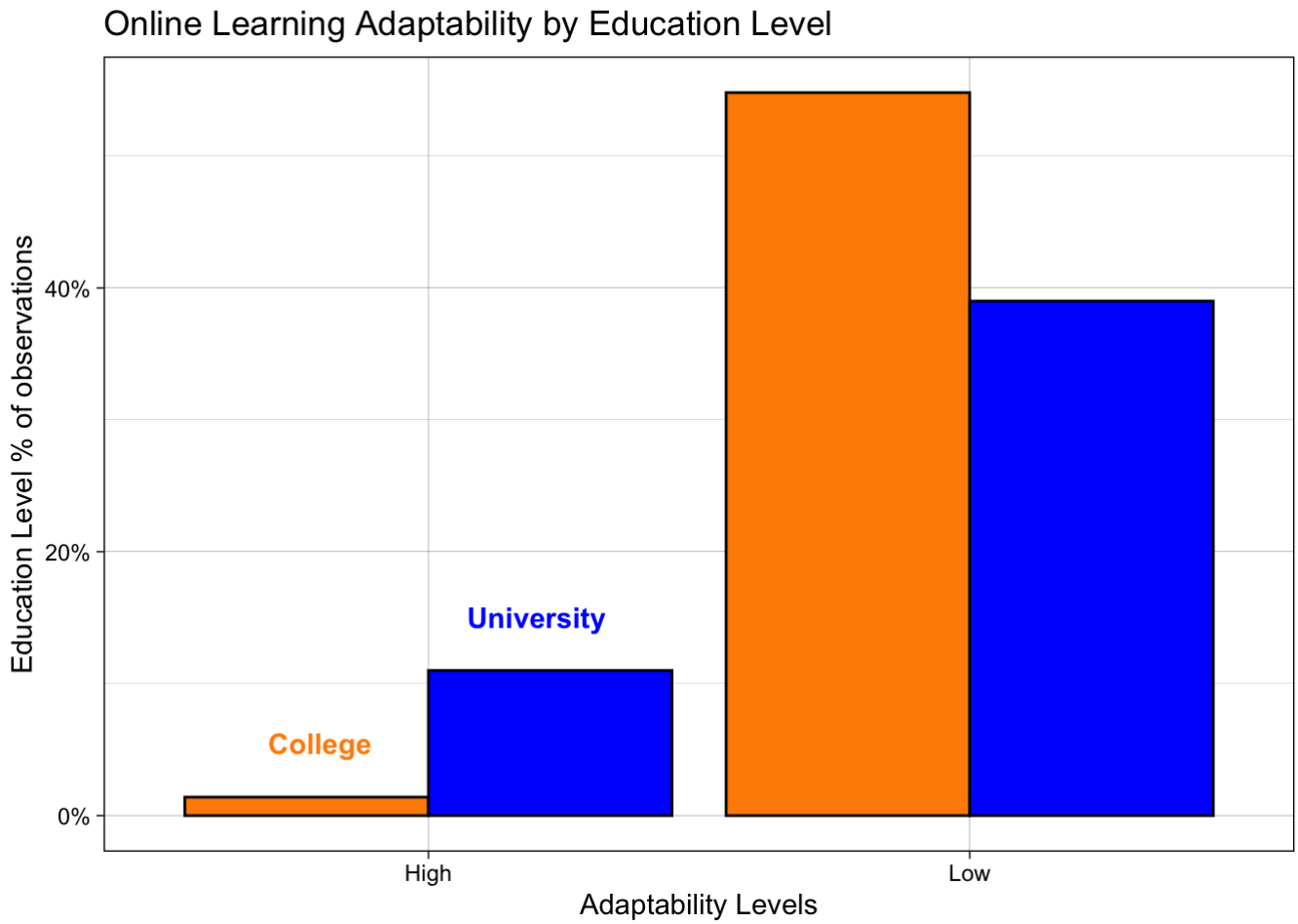
A larger proportion of low-income students attend private universities, which contradicted our expectations. This could in part be explained by greater private funding in private institutions generating higher merit scholarships compared to scholarships at private universities, which are funded through the government.

Next, we considered how the duration of classes impacted the students' adaptivity.



Interestingly, there is little difference between classes with a 1-3 hour daily average, and classes with a 3-6 hour daily average. There is, however, a dramatic impact on student adaptivity when it comes to entirely asynchronous classes, which have a significantly larger rate of low student adaptivity.This would suggest that the most important aspect of class time is not the length of the class itself, but that there is any synchronous class time at all- perhaps this has to do with greater opportunity for students to ask questions in real time, bond more with their peers and teachers, and understand concepts in greater detail through lectures.

Finally, to consider how different institutions fare in student adaptivity, we considered the differences in adaptivity among college students and university students.



Compared to universities, colleges had lower levels of adaptivity among their students. Regardless of which factors contribute to this disparity, this distinction is interesting and potentially important in considering the distribution of government funding across different institution types (as there are both public and private colleges and universities considered in the data). Based on the large difference between colleges and universities regarding student adaptivity, it is worth considering that online-learning resources would more greatly benefit college students than university students.

All of these findings considered, our exploration of this student adaptivity data suggests that schools should prioritize synchronous learning materials over asynchronous ones (even if class duration is short) and making resources more available to low-income students- this is especially important for institutions with teenage students and colleges. In general, financial condition is a clear indicator of how successful students are in an online learning environment. Although there is not much that an institution can do to change their students' financial condition, especially in the short-term, making an effort to provide more accessible learning materials for low-income students would put them in a much better position to be highly adaptive to online learning- this could include lowering textbook costs if possible, or allowing students to rent necessary hardware. Funding could also be better allocated by legislators to ensure the success of students most vulnerable to low adaptivity- perhaps colleges should be prioritized over universities to receive public funding. Additionally, our data suggests that synchronous classes, regardless of their length, are important for a student's success in online learning- if possible, schools could put more resources into synchronous vs. asynchronous online classes, even if meetings must be shortened to comply with staff availability restraints.