

Online Undergraduate Mathematics Classes Impact on Student Perceptions

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Background

Online learning has been present in universities and other post-secondary institutions since the introduction of internet access in the 1990s (Johnson & Seaman, 2022). The COVID-19 pandemic has since caused higher demand for online learning and remote instruction to assist with mitigation efforts of the global pandemic (Barlow et al., 2020; Ramadhani et al., 2021). Specifically in mathematics courses, online platforms such as Desmos, GeoGebra, MyMathLab, and WeBWork are used to supplement learning and teaching (Hauk & Segalla, 2005; Oates et al., 2014). A research study by Serhan and Almeqdadi (2020) on student perceptions of MyMathLab and WebAssign found advantages of using online platforms to be immediate feedback and flexibility of access. Another study by Valdez and Maderal (2021) indicated students preferred online homework over pen-and-paper traditional methods due to the accessibility of lecture notes and math software. Despite the possibilities that online learning offers, there are possible challenges for students in undergraduate math classes. Issues with technology, internet difficulties, and ease of forgetting assignments were challenges students faced in undergraduate online math classes (Serhan & Almeqdadi, 2020). Furthermore, if students were not trained on given technology, they faced difficulty with using online tools and technology effectively. Other challenges are how time-consuming and non-user friendly various online tools can be (Hauk & Segalla, 2005; Naidoo, 2020). With these challenges in mind, the aim of this research is to explore student perceptions in online undergraduate math classes.

Methodology and Results

This study was conducted at a public university in the northeast region of the United States. In spring 2021, 19 online sections of Probability and Statistics were included in the study with 39 out of 464 students consenting to participate. Face-to-face courses were not an option due to the worldwide pandemic. The study participants completed a 17-item survey measuring their perceptions of learning mathematics online. Data was analyzed quantitatively using descriptive statistics.

Despite the small response rate, this study yielded some interesting preliminary findings. Some results included 41% of the students stated they were motivated to complete assignments, 39% were not confident in succeeding, and 59% believed they would perform better had the course been offered in person. These findings mirror those from Serhan and Almeqdadi (2020). When students were asked about the challenges they were facing, motivation was selected with the highest frequency (64%), and 51% of students stated they struggled with understanding course material. The pandemic forced universities to move courses online, and students had no choice in their course delivery. Many participants shared common suggestions and concerns to make online learning better. They requested live meetings (face-to-face or video conference), more accessible content, and the inclusion of clear explanations. Further results and areas for future research will be presented in the poster.

References

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Impact of Online Undergraduate Mathematics Courses on Student Perceptions

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Abstract

The mode of instruction, online versus face-to-face classes, may be a positive or a negative experience. During the spring 2021 semester, data was collected from three online statistics courses to measure student perceptions. This poster presentation will discuss the impact of online undergraduate mathematics classes on student perceptions.

Background

While online learning has played an important part of curriculum and teaching in universities, it has become more prominent due to the need for distance education to help mitigate the spread of COVID-19 (Ramadhani, 2021). Online platforms like Zoom, OER (open educational resources), and Blackboard allow for learning to be flexible, adaptable, and accessible to students. However, with online learning comes unforeseen challenges. Researchers have found difficulties in communication (Ramadhani, 2020), issues with technology, and ease of forgetting assignments (Serhan & Almeqdadi, 2020). Other researchers found that online platforms such as WeBWorK were not user-friendly (Hauk & Segalla, 2005). Research is needed to understand the influence of online classes on student perceptions.

Research Question

What are the impacts of an online undergraduate mathematics class on student perceptions?

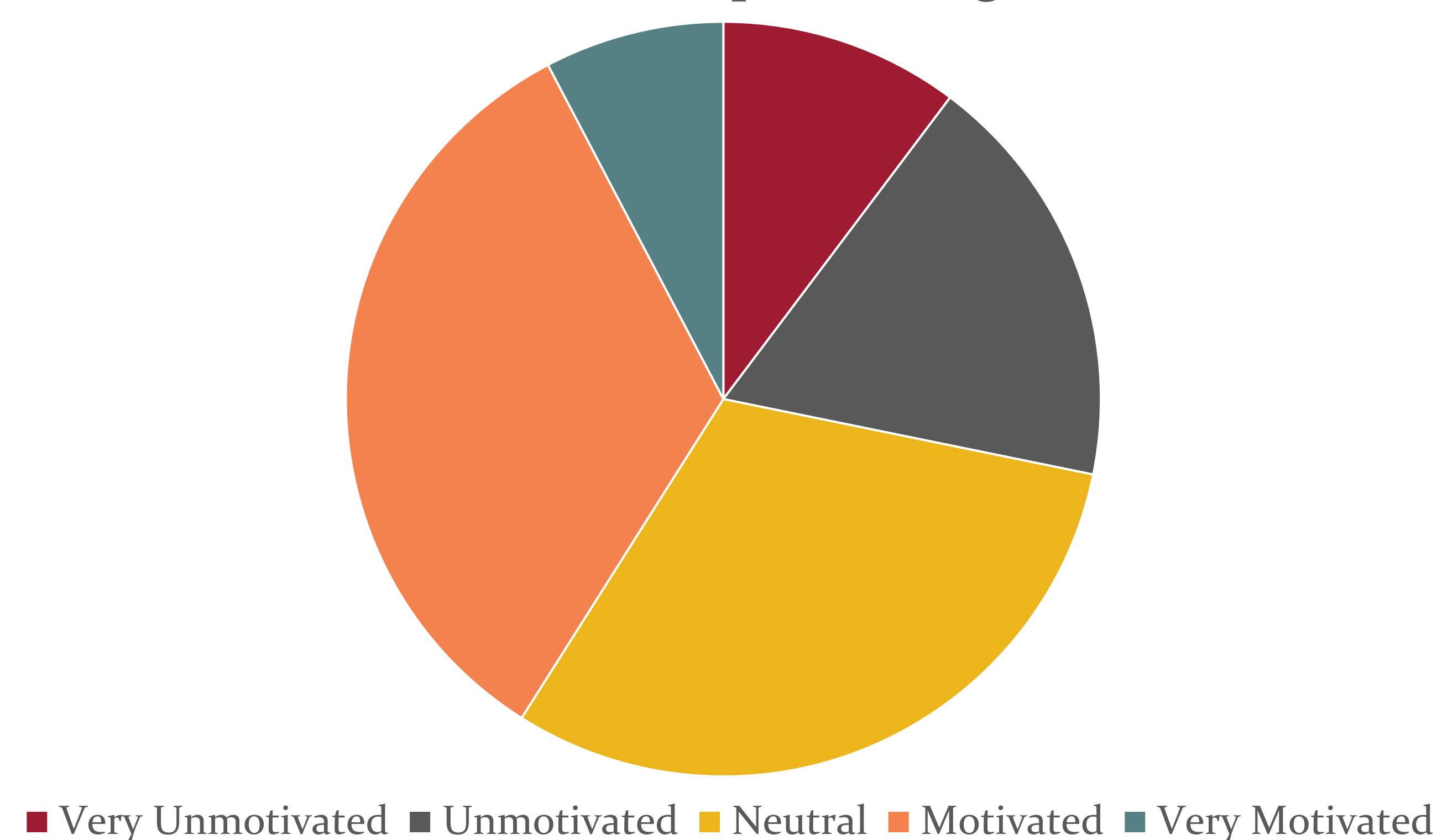
Methodology and Procedures

Due to the variety of majors represented amongst statistics classes, the perceptions of students from three undergraduate statistics courses were examined in this study; Probability and Statistics, Probability and Statistics for Business Majors, and Probability and Statistics for Natural Science.

A 17-question online survey was distributed among 464 students across 19 sections of these courses, of which 39 responded yielding a response rate of 8.41%. Data was analyzed using descriptive statistics.

Results and Discussion

Motivation to Complete Assignments

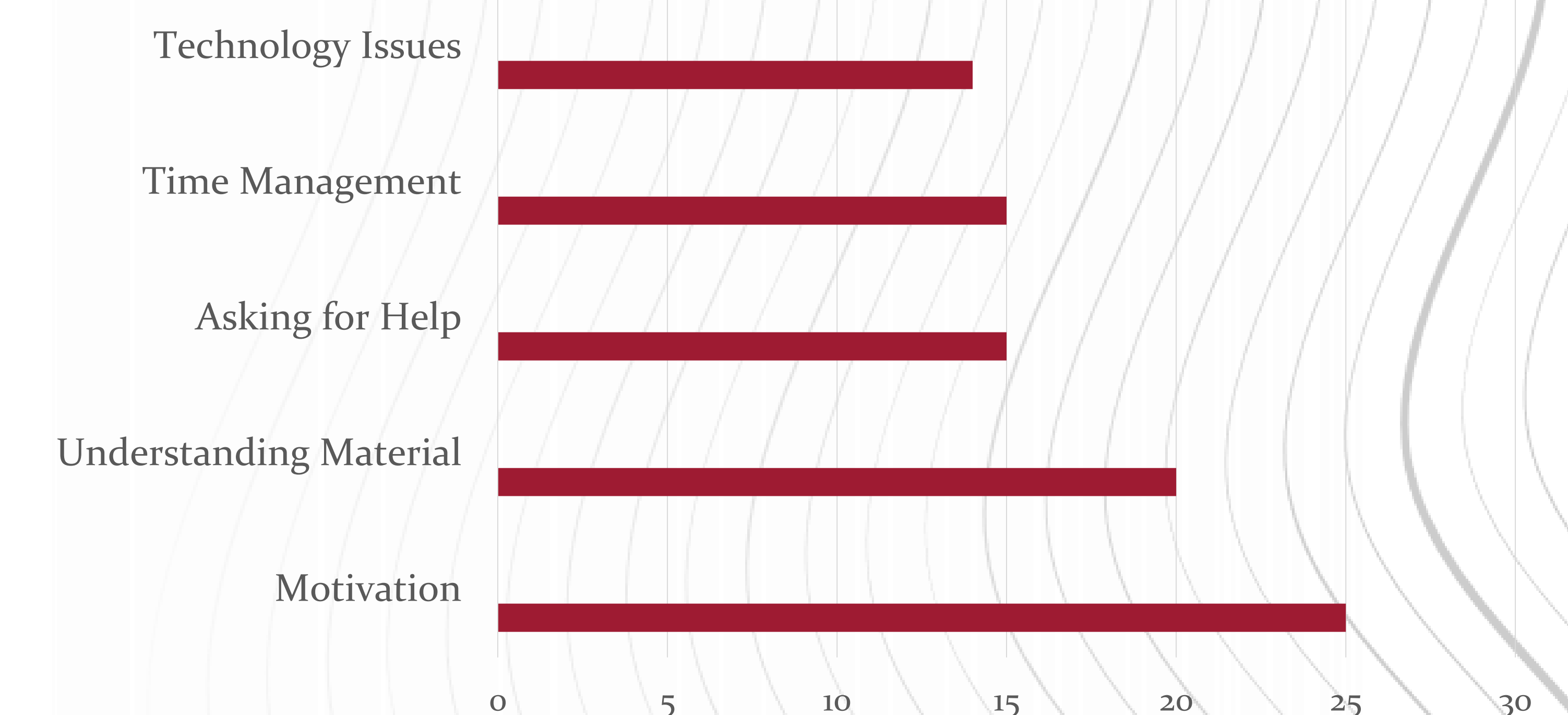


41% of the students from this sample stated they were motivated to complete assignments. Approximately 39% of students were not confident in succeeding in their statistics course. However, about 59% stated they would perform better had the course been offered in person.

Results and Discussion Cont'd

Students shared their opinions about challenges they faced while learning statistics online. The top 5 challenges were staying motivated, understanding the material, asking for help when struggling, time management, and technology difficulties.

Top 5 Challenges in Online Learning



Some general themes emerged when students were asked “what could make this course better?”. The themes were

- the request to have live meetings (face-to-face or video conference)
- need more access to the content, and
- include more clear explanations/instructions.

Student statements specifically addressed technology, such as WeBWorK not being user-friendly, asking for lectures to be posted online, and having specific instructions and training for how to use course software (R Studio).

Citations

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