(PSII-9) Preliminary Evaluation of the Impact of the COVID-19 Pandemic on Student Performance and Perceptions of Learning in Two Undergraduate Animal Science Courses

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ABSTRACT

The duration of the COVID-19 pandemic through the 2020 and 2021 academic years has greatly affected higher education. Student learning shifted to a largely online environment and students' outlook on their own performance appeared to decrease greatly across many fields. Our objective was to assess student performance across three classroom types along with student perceptions of learning to better understand the impact of COVID-19. We evaluated overall student performance in undergraduate animal genetics and large animal physiology courses across three semesters. Semester 1 took place pre-COVID-19 while students were able to attend in-person. Semester 2 was a transitionary semester in which courses were forced to unexpectedly pivot to online learning mid-semester. Finally, semester 3 took place amidst the pandemic and was conducted fully online. Students received two surveys containing nearly identical questions regarding thoughts on their own performance, class structure, overall attitude towards learning, and new barriers to learning during the COVID-19 pandemic. One survey was given halfway through the semester and a second during the last week of the semester to determine any change in student perceptions as the course progressed. Survey analysis showed consistent influence of COVID-19 within the classroom. Many students indicated either contracting COVID or caring for someone with COVID as a factor affecting their performance within the course. Although the majority of students preferred the asynchronous course design, many had indicated some difficulties regarding minimal interactions with the professor and teaching assistants. Despite conflicting perceptions, student performance appeared to be greater (P < 0.05) in semester 2 and 3 compared to semester 1, with no difference between the semesters occurring during the pandemic. Overall, this study indicated that student performance in two foundational courses was not negatively affected by an abrupt shift to online learning despite an adverse student outlook. While students reported online learning being more difficult and a preference for in-person learning, it is possible this increased effort created desirable difficulties and resulted in the enhanced performance.

HYPOTHESIS

- Student performance in undergraduate courses will be hindered due to an abrupt shift to online learning.

- Student perceptions of the online classroom will be negative due to preference for in-person learning and added uncertainty of the COVID-19 pandemic.

METHODS

PARTICIPANTS
- Undergraduate students enrolled in one of two courses:
  - ANEQ 328: Foundations in Animal Genetics
  - ANEQ 305: Functional Large Animal Physiology

COURSE FORMAT
- Semester 1: Before COVID, fully online, traditional lecture format
  - ANEQ 328 n= 136 , ANEQ 305 n= 97
- Semester 2: Onset of COVID, mid-semester shift to online learning
  - ANEQ 328 n= 138, ANEQ 305 n= 81
- Semester 3: COVID ongoing, online learning w/ optional in-person recitation
  - ANEQ 328 n= 97, ANEQ 305 n= 126

PERFORMANCE
- Final course grade was collected across all three semesters for both courses
- Data were analyzed by ANOVA and pairwise comparison of final grades

PERCEPTIONS
- Mid and end of semester surveys conducted in covid centered classroom (semester 3)
- Thematic analysis of free response questions
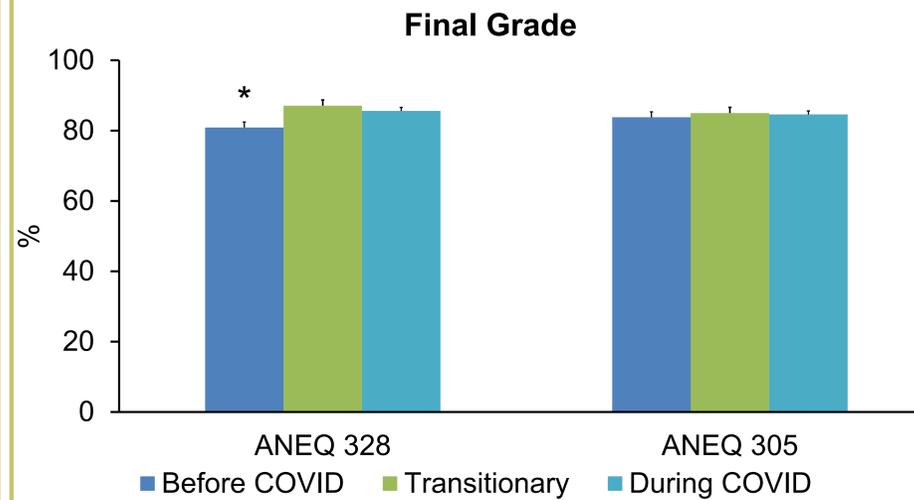- Comparison of self reported quantitative data

RESULTS

Figure 1. Student performance assessed by final grade in two undergraduate animal science courses across three semesters spanning the COVID-19 pandemic.

- Final grade for students in ANEQ 328 increased in the transitionary and online COVID classroom compared to the in-person pre-COVID classroom.
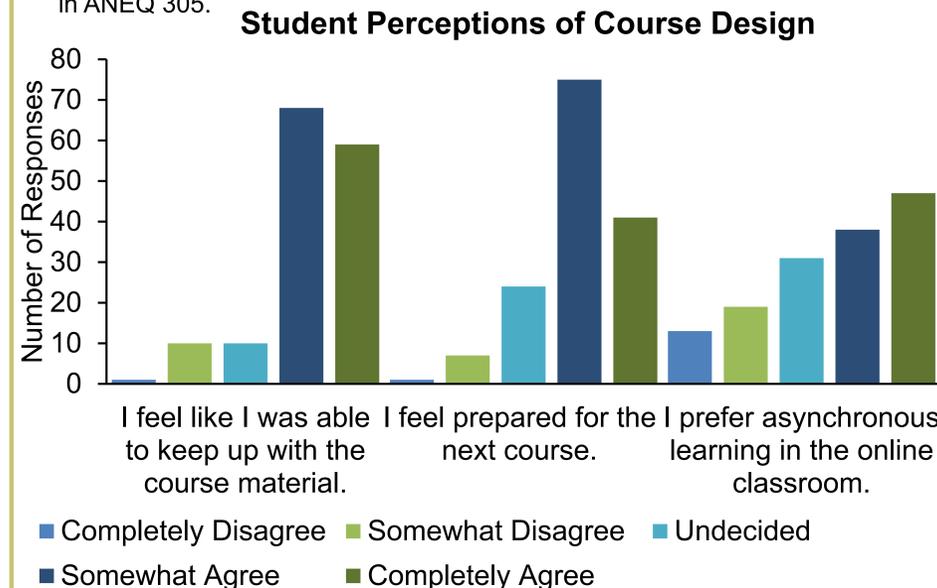- There was no difference in final grade between semesters for students enrolled in ANEQ 305.

Figure 4. Self reported perceptions of online learning in two undergraduate animal science courses during the COVID-19 pandemic.

- The majority of students felt they were able to keep up with course material and were prepared for the next course.
- The majority of students preferred asynchronous learning in an online course.
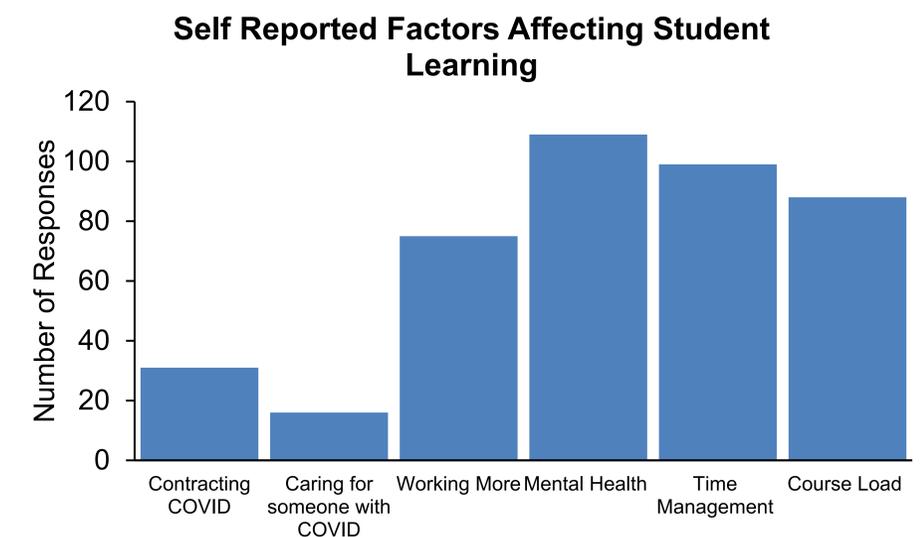
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Figure 2. Self reported factors affecting student learning at the end of the fully online semester during the COVID-19 pandemic.

- Students reported mental health and time management as the greatest factors affecting their learning.

Not attending in-person courses due to heavy workload
- "I have attended recitation only once and it was because I had the time available to do so. I work about 30 hours a week to pay rent and other life expenses, so I've taken advantage of the asynchronous online schedule to work more hours during the day and week opposed to nights and weekends."

Not attending in-person courses in fear of COVID-19 exposure
- "I have not been attending recitation to avoid as much in person interaction as possible because of COVID-19."

Prefer hybrid course format
- "I really like the course and the way it is set up. For me, the asynchronous lectures with an in-person option for recitation makes it very easy for me to keep up with the course work but still makes it easy to get help if I need it."

Prefer multiple quizzes and case studies to traditional exam structure
- "The small assignments, especially the worksheets, are useful for practicing the material, and having them be untimed and low stakes is much less stressful and more conducive to retention than a timed or high-stakes assessment."

Figure 5. Thematic analysis of course design at the end of the fully online semester during the COVID-19 pandemic

- Themes regarding fear and inability to attend in-person course options consistently appeared in both hybrid courses
- Students appreciated hybrid course designs along with low stake assignments to cope with the increased challenges brought upon by the pandemic.

IMPLICATIONS

- Student performance was not negatively impacted by an online classroom in the evaluated courses
- Increased effort needed for online learning may have created desirable difficulty
- Hybrid course formats appear to be beneficial for student time and mental health
- Small stake assignments pace student learning and ease mental health burden for students as compared to few large stake exams during the pandemic.