Science Societies

Understanding attrition risk for online students

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The success of online programs hinges on long-term student engagement. Online programs have made education more accessible than ever before and done wonders in helping people reach their academic goals. A recent study, published in the journal *Natural Sciences Education*, aimed to determine if educational preparation, student characteristics, and student enrollment patterns could predict the risk of students leaving online programs.

The main risks associated with students leaving programs vary between online environmental science and natural resources programs. In the natural resources program, significant relationships were found between student age, gender, race, degree background, undergraduate grade point average, and time between degrees.

Seventy percent of students who withdrew from the programs did so in the first three terms, correlating that the biggest risks happen early on. As such, early program support could potentially avoid losing students early in the program.

Online graduate students tend to have lower success rates than in-person students.

The phenomenon of students discontinuing programs isn't well understood, but it has been of interest to researchers in the education field.

Why attrition risk matters

While online education makes higher education more accessible for those living far from campus (assuming they can pay for it), data from the National Center for Education Statistics show that online graduate students tend to have lower success rates than in-person students. This is especially true for STEM students. This research helps us understand how to potentially better support graduate students in science. Online enrollment has doubled in the last decade, but national reports don't separate thesis programs and non-thesis programs, so the data isn't clear.

The COVID-19 pandemic made it harder to measure graduate student success in online programs because so many schools moved to purely online platforms, which increased stress and demand on educators, according to an NBC News article

published by Anthony Klotz in 2021. However, researchers found that students who were already in online programs showed no increased risk of discontinuance during the COVID-19 pandemic. While online education offers a greater degree of flexibility for students and is more affordable, it comes with its own set of challenges that researchers are still working to understand. The study in *Natural Sciences Education* designed a prediction model that considers challenges specific to online graduate students.

This study explored how likely master's students in non-thesis programs were to discontinue from online programs in natural resource or environmental sciences. It sought to answer the following questions:

1. Does the risk of students leaving differ between master's programs for natural resources and environmental science?

2. What relationship do student characteristics (gender, race, age) and educational background (undergraduate grade point average (GPA), undergraduate degree field, time between degrees) have with their risk of withdrawing from natural resources and environmental science programs?

3. Which internal factors (enrollment practices, institutional GPA, number of credits each term) impact discontinuance risk in the natural resources and environmental science programs?

4. Do student characteristics differ between natural resources or environmental science discontinued students and graduates?

5. Did the COVID-19 pandemic significantly increase discontinuation compared with enrollment?

Key findings from the study

This study was conducted at the University of Idaho where 35% of its graduate students are registered online. It looked for possible correlations between students' characteristics, educational background, and enrollment patterns when it came to their rates of exiting graduate programs. Here were the key findings:

- Students who had less time between their degrees were significantly more likely to discontinue.

- Risks of leaving varied among two similar programs.

- Existing data don't explain what helps students stay in graduate programs.

- Only 10% of students discontinued.

- For all genders, 70% of people who left did so in the first three terms.

- Men in the natural resources program had a higher risk of leaving than women, being 2.4 times as likely to discontinue their studies as opposed to staying.

- People in environmental science programs with a higher GPA were at a lower risk of discontinuation.

- There was no significant risk of discontinuation from not having an undergraduate degree in a natural resource field.

- 90% of students in both programs who did not register (stopped out) for a term resumed their courses or graduated during the period.

Ultimately, the model was able to significantly predict student discontinuation from the natural resource program but not the environmental science program. Mandatory orientations may improve early persistence by helping students connect with faculty, staff, peers, and resources. Also, cumulative GPA is a strong sign of how likely someone is to succeed in these programs.

The lack of national reporting on this problem forces universities to try and figure out solutions on their own, which often leaves university leaders in the dark. The evidence demonstrates that risks can vary by program, but the model wasn't able to predict if and when students leave environmental science programs early. Future research will be needed to understand how this works, and researchers will need to look beyond individual classes to get a grasp of the bigger picture, looking at populations and institutions on a national scale.

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Dig deeper

B., Soria, K. M., Kobziar, L., & Daley-Laursen, S. B. (2025). Online programs: Attrition risks differ between environmental science and natural resource master's non-thesis students. *Natural Sciences Education*, *54*, e70005. https://doi.org/10.1002/nse2.70005

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