

**Teaching Culturally and Linguistically Diverse International Students in Open and/or  
Online Learning Environments: A Research Symposium**

**The Pandemic Pivot at an Ontario College of Applied Arts and  
Technology: A Review of International and Domestic Student  
Success**

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**Abstract**

*Building on an earlier action research project looking at international student grades at an Ontario College, the researchers explored the impact of learning in an online learning environment on international student performance. The researchers asked: 1) Is there a significant difference in the average student grades (regardless of country of residence or origin) between online delivery and in-person delivery? 2) Is there a statistically significant difference in average student grades between delivery methods, based on country of origin or residence?; and 3) Is there a statistically significant difference in average student grades between domestic and international students, based on delivery? A comparison of grade data of in-person classes versus online learning indicate that both international and domestic students showed improved grade performance in online learning. Further, while the earlier study indicated that international students had lower grade performance than domestic students, the gap between international and domestic student grade performance closed slightly with online learning.*

**Keywords:** COVID-19, international students, online learning, Ontario colleges, student success

## Introduction

The objective of this project was to determine the relative success of both international and domestic (Canadian), first-year business students at a mid-sized Ontario College of Applied Arts and Technology during the 2020–2021 academic year. Like most institutions across the world, the program was delivered using a mixture of synchronous and asynchronous virtual delivery, during the 2020-2021 academic year. While the COVID-19 pandemic accelerated the plans of many institutions to implement virtual delivery of courses, there is growing consensus that this delivery mode will be here to stay (Li & Lalani, 2020). Within the Ontario college sector, over 70 million Canadian dollars have been allocated to support the expansion and quality of online delivery over the next two years (Colleges Ontario, 2021).

The goal of this research was to provide a current context to this gap in the literature, discussed below, by contrasting student grades from the 2020–2021 academic year against three previous years of data of the same program delivered in a traditional face-to-face setting. The research questions guiding this study were:

1. Is there a significant difference in the average student grades (regardless of international student or domestic student status) between online delivery and in-person delivery?
2. Is there a statistically significant difference in average student grades between delivery methods, based on international or domestic student status?
3. Is there a statistically significant difference in average student grades between domestic and international students, based on delivery?

## Literature Review

Part of the context for this research study is another study conducted by the same team, at the same Ontario College, four years earlier. That action research study sought to examine international student success, as reflected in course grades. There was anecdotal evidence that international student grade performance was lower than domestic student grade performance. The study confirmed that this was the case, and actions were taken to support international and domestic student success (McGregor et al, 2021). As in-person learning pivoted to online learning in response to the COVID-19 global pandemic, the researchers wanted to understand more about if, and how, this new learning landscape would impact international student grade performance.

Existing literature on the grades of international and domestic students in online courses is limited, and non-existent in the context of Ontario colleges. One paper from 2008 found that on average, students of Asian cultures perform more poorly than students of western cultures in online courses (Coldwell et al., 2008). Beyond academic performance, it should be noted that many international students have endured a pandemic in a country foreign to them, and faced unique problems beyond the classroom, including visa and travel issues (Rana, 2021), as well as uncertainty over their immigration process post-graduation (Okwuosa, 2021). Further, with the majority of international students registered in Ontario colleges being of Indian descent (StatsCan, 2018), and the dire situation of the pandemic in India (WHO, 2021), the barriers to success this academic year were higher than ever. One American study on the lived experiences of international students during the past academic year shed light on just how challenging it has been for them, yet also offer hope, as it noted a high level of resilience that many international students demonstrated (Honegger & Honegger, 2020).

The literature also indicates that international and domestic students place more value on different elements of online learning. International students, for example, place more value on instructor interaction than do domestic students (Ndoye, & Martin, 2021). Lack of faculty interaction, with learners who prefer it, can impact accessibility, and there is evidence that faculty at post-secondary institutions lack the training and knowledge needed to effectively support students in online learning. A 2021 study found that there is an “uneven level of readiness” amongst faculty, in terms of accessibility standards, quality standards, use of tools, and access to professional development (Guilbaud et al., 2021, p. 6).

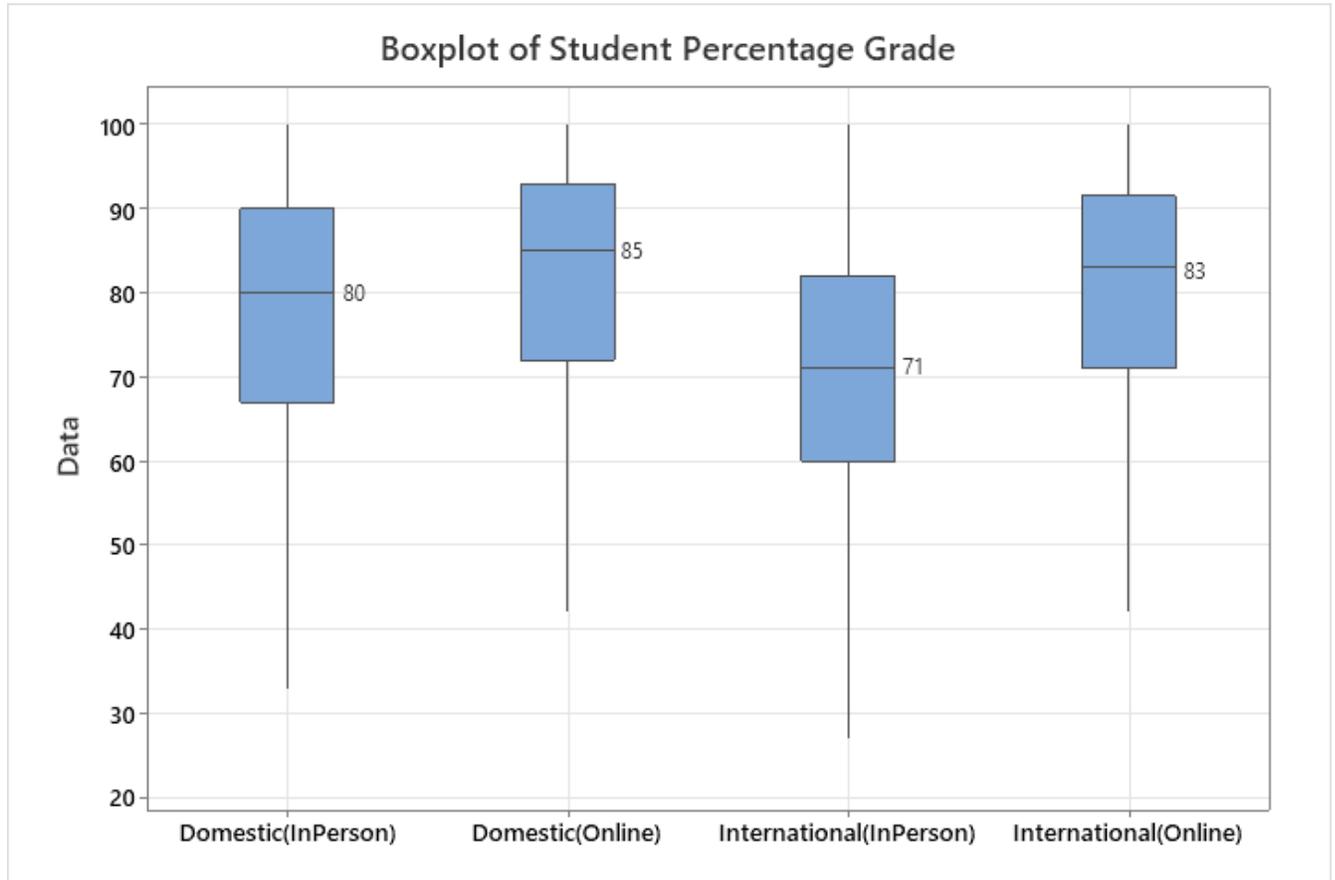
## **Methods**

To gather data for comparison, student grades from a first-year School of Business program at an Ontario College of Applied Arts and Technology from both the 2020–2021 academic year as well as the 2016–2017, 2017–2018, and 2018–2019 academic years were gathered from an internal database. Having access to three years of in-person course delivery grade data ensured the ability to compare this academic year, in a greater context, to ensure outliers from previous years were not impacting the comparison. Grades were pulled at an individual level and on a class-by-class basis, resulting in 12,494 records of domestic student in-person learning, 9,748 records of international student in-person learning, 1,146 records of domestic student online learning, and 405 records of international student online learning. Minitab was used to perform statistical analysis to address the research questions stated above. It should be noted that all groups from above were treated as independent of each other, including differences between semester one and semester two, since not all students progress beyond semester one. Further, there is a significant difference in sample size between online and in-person learning due to the fact that online learning has only occurred for one academic year. Data collection and scrubbing was conducted by an independent third party to the research team, outside of the School of Business, to ensure that there was no identifiable data to protect the privacy of students. Because of this, approval from the Research Ethics’ Board was not necessary.

## **Results**

Upon a preliminary review of the data, there appeared to be improvement for both domestic and international student grades in the transition from in-person to online learning as demonstrated in Figure 1 below.

**Figure 1**  
*Median Grades Comparison*

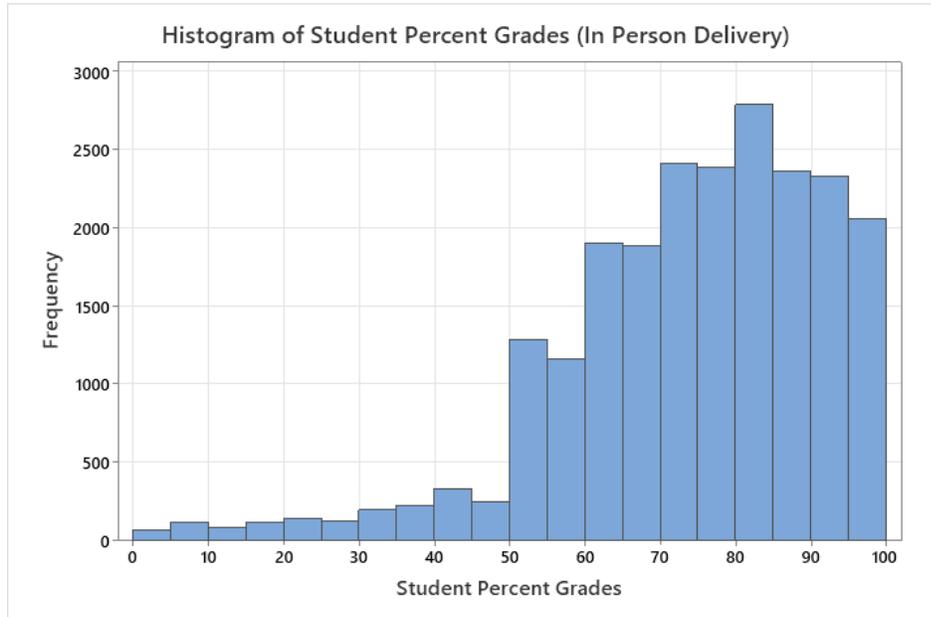


To better understand the story this data was telling, hypothesis testing was performed for each research question to determine significance.

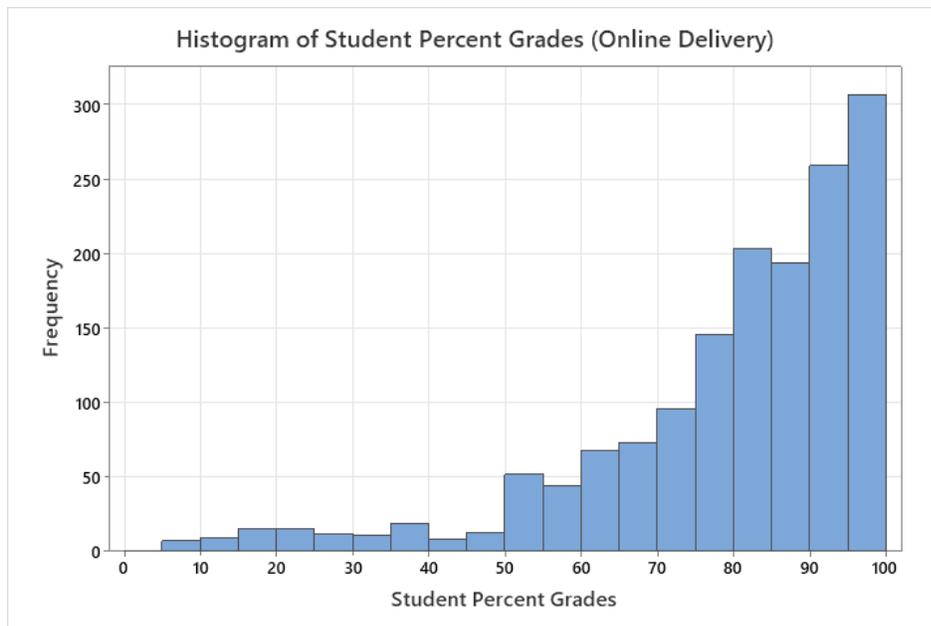
**Question 1: Is there a significant difference in the average student grades (regardless of international student or domestic student status) between online delivery and in-person delivery?**

Distribution of student grades, regardless of country of origin or residence, appeared to be skewed, and did not follow a normal distribution, as evidenced in Figure 2 and 3 below. Based on Kolmogorov-Smirnov test, we found  $p < .010$ , confirming a rejection of the normal assumption.

**Figure 2**  
*Histogram of Student Grades for In-person Delivery*



**Figure 3**  
*Histogram of Student Grades for Online Delivery*



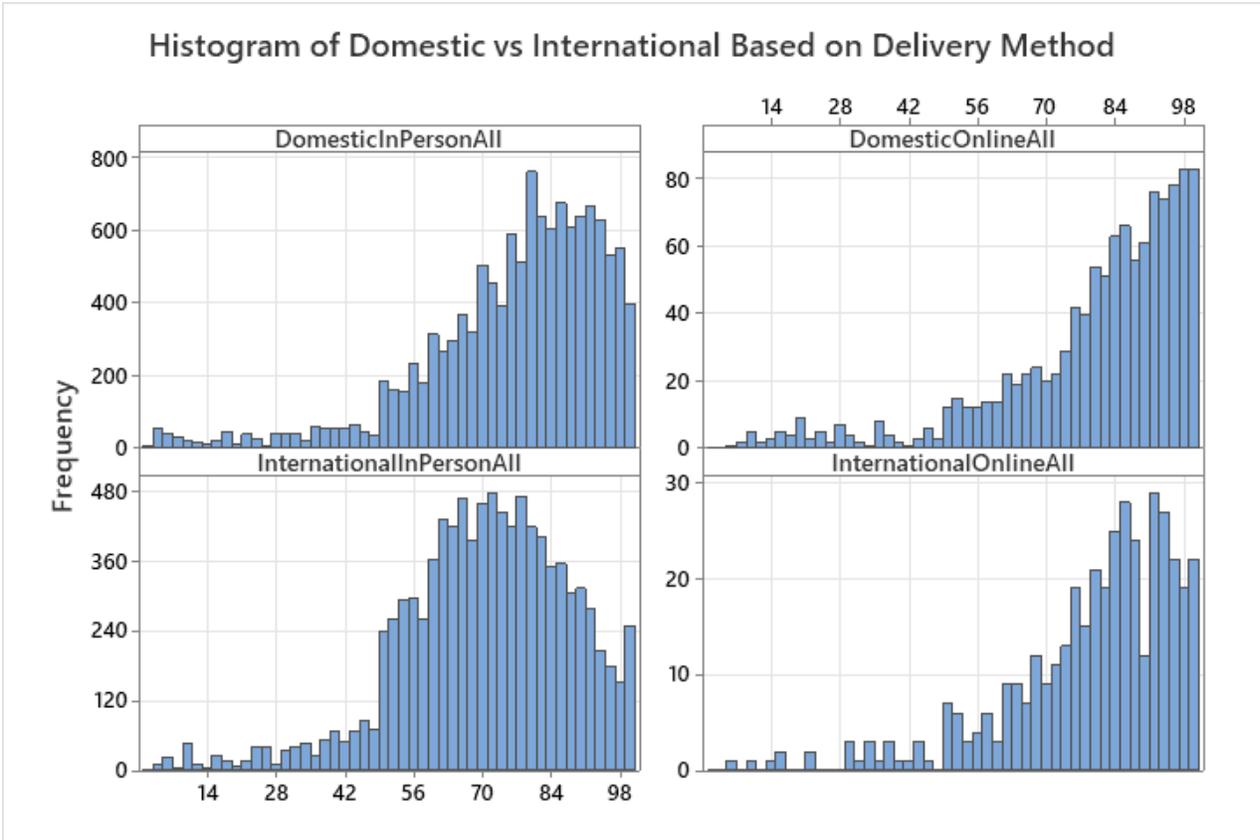
Due to the skewed nature of the data, the median was used as the preferred measure of central tendency in place of the mean. To see if a significant difference exists in average student grades between in-person and online delivery, a non-parametric Mann-Whitney Test was performed, which found that  $p < .05$ , therefore, there is enough evidence to suggest a difference in

the median student grade based on delivery. Student grades for both domestic and international students were higher in online delivery.

**Question 2: Is there a statistically significant difference in average student grades between delivery methods, based on international or domestic student status?**

As evidenced in Figure 4 below, there is evidence of a non-normal distribution of student grades, and the results of a Kolmogorov-Smirnov test produced a p-value less than .010, again suggesting that the normal assumption be rejected.

**Figure 4**  
*Histogram of Domestic versus International Grades by Delivery Method*



To determine if a significant difference exists in average student grades between in-person and online delivery (based on country of origin or residence), a Mann-Whitney Test was performed. As with question one, this again produced a  $p < .05$  result, suggesting there is a difference in median student grade based on delivery modality, with respect to country of origin or residence. Confidence intervals from the data analysis demonstrated international students had greater grade improvement than domestic students in online delivery, as compared to an in-person classroom.

### **Question 3: Is there a statistically significant difference in average student grades between domestic and international students, based on delivery?**

As we have found previously, a normality test concluded that the normal assumption be rejected, thus a Mann-Whitney test was once again used to determine statistical significance for both international and domestic student data. The tests both produced a p-value less than .05, therefore both delivery methods show a statistically significant difference between domestic and international student grades. Thus, it can be said that the gap between domestic and international student achievement was tightened in the transition from in-person learning to online learning. It should also be noted that when the comparison of online delivery is used, the difference in median grades between domestic and international students is not as statistically significant as the difference between domestic and international students, when in-person delivery is used for comparison.

### **Discussion and Conclusion**

Given everything that seemed to be working against students in all levels of education this year, it was interesting to find that there was an improvement in median grades across both domestic and international students. Despite indicating positivity for the efficacy of online delivery relative to in-person delivery, it must be made very clear that this study lacks the context required for this research to serve as anything beyond a foundation for a more robust and complete analysis of the academic year that has just passed.

There are some important questions that this research study did not address, leaving opportunities for further research. For example, 1) Were academic expectations lower during the global pandemic, when the online learning studied occurred, impacting grades?; 2) Did an emphasis on a pedagogy of caring influence how faculty approached teaching and assessment during the pandemic?; 3) Were international students, living in their home country while studying online, experiencing fewer stressors (such as culture shock), than they would have were they living in Canada?; 4) Did the recent diversification of the international student body at this college impact international student grade performance?; and 5) Did the challenges of online learning serve as a selection tool, ensuring that only the highest achieving international students continue to pursue their education during the global pandemic?

Further research could include a qualitative study that could better understand the lived experiences of international and domestic students in Ontario colleges over the previous academic year. On a larger scale, a longitudinal study of graduates and their employers, with respect to their career readiness, would help us to better understand the long term impacts the pandemic has had on this cohort of students. Finally, it might be helpful to perform a course level analysis to determine if some courses are better suited to online delivery than others.

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