# WHERE DID THEY GO? REGIONAL PATTERNS IN EARLY TRANSFER IN ONTARIO POST-SECONDARY EDUCATION

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## Abstract

Research on transfer student flows has focused almost exclusively on transitions occurring between colleges and universities. Few have sought to systematically examine the regional dimensions of these student flows, and how they may map on to prevailing migration patterns that drive individuals out of remote geographical regions. Through this study, we perform the first comprehensive analysis of regional dynamics in early transfer student flows within Ontario post-secondary education (PSE), drawing on novel administrative linkages within Statistics Canada's Education and Labour Market Linkage Platform (ELMLP). Our empirical analyses (i) map the magnitude of transfer student flows across the province, and (ii) statistically model the predictors of within- and cross-region forms of student transfer. Our findings demonstrate that PSE students commencing their studies in the provincial north are more likely to transfer out of their region, and that correcting these imbalances could serve as a useful strategy to retain and inject further human capital into northern communities. We explore the implications of these findings for both provincial policy makers and researchers interested in how geography shapes student trajectories.

*Keywords:* transfer, colleges, universities, out-migration, north, rural, Ontario

## Résumé

La recherche sur les flux des étudiants en transfert s'est concentrée presque exclusivement sur les transitions entre collèges et universités. Peu de recherches examinent de manière systématique l'aspect régional de ces flux d'étudiants et la manière dont ces derniers s'inscrivent dans les modèles de migration dominants poussant les individus à quitter les régions géographiques éloignées. Dans le cadre de cette étude, nous effectuons la première analyse exhaustive des dynamiques régionales dans les premiers flux d'étudiants en transfert au sein de l'enseignement postsecondaire de l'Ontario en nous appuyant sur des couplages novateurs provenant de la Plateforme longitudinale entre l'éducation et le marché du travail (PLEMT). Nos analyses empiriques i) évaluent l'étendue des flux d'étudiants en transfert à travers la province et ii) modélisent statistiquement les facteurs prédictifs des étudiants en transfert au sein de différentes régions et entre celles-ci. Nos résultats montrent que les étudiants du postsecondaire commençant leurs études dans le nord de la province sont plus susceptibles de se déplacer hors de leur région, et que la correction de ces déséquilibres pourrait servir de stratégie utile pour retenir et injecter davantage de capital humain dans les communautés du nord. Nous explorons les implications de ces résultats pour les responsables provinciaux et les chercheurs intéressés par la façon dont la géographie façonne les trajectoires des étudiants.

*Mots-clés :* transfert, colleges, universités, migration de sortie, rurale, Ontario

# Introduction[1]

Research on student mobility in Canada and other international jurisdictions has focused disproportionately on mapping the precursors and outcomes associated with students travelling non-linear pathways (e.g., college-to-university) between post-secondary education (PSE) organizations (Pizarro Milian & Zarifa, 2022). Such focus aligns with the prevailing interests of PSE administrators and policy makers who fixate on augmented transfer credit and inter-organizational pathway articulation as levers to facilitate student flows and broader system efficiency (e.g., Council of Ministers of Education, Canada, 2009; Government of Ontario, 2011; Pizarro Milian & Munro, 2020). On the other hand, few have empirically examined the regional dimensions of transfer student flows in Ontario (e.g., Decock, 2006; Decock et al., 2011; McCloy et al., 2017), despite there being significant interest in how geography shapes other forms of student decision making in Canada (e.g., Frenette, 2004, 2006, 2009; Hango et al., 2021; Zarifa et al., 2018) and other nations (e.g., Cullinan & Duggan, 2016; Suhonen, 2014).

The regional dimensions of transfer student flows are pertinent to remote northern communities in Canada that face stagnant population growth vis-à-vis urbanized southern counterparts (Statistics Canada, 2022), despite concerted and well-funded efforts on the part of federal, provincial, and municipal governments to attract both international immigrants and southern residents to the north. These communities face an array of inter-related barriers that limit their economic development and the prosperity of their inhabitants (Pizarro Milian et al., 2020), many of which have been described by the Federation of Canadian Municipalities as being "trapped in almost Third World living conditions" (Coates & Poelzer, 2010, p. 1). These obstacles range from harsh weather conditions (Prentice & Stuart, 2009) to underdeveloped infrastructure (Koch, 2021; Mc-Mahon & Akçayır, 2022), dependency on fading natural resource extraction industries (Sloan Morgan, 2020), and political marginalization (Coates et al., 2014). Studies have found that youth outmigration from peripheral Canadian communities is commonly driven by the pursuit of post-secondary training or employment opportunities that are plentiful in southern urban hubs (Corbett, 2007; Harling Stalker & Phyne, 2014; Hillier et al., 2020). However, student movement within PSE remains unexamined as a mechanism that could either amplify or counter prevailing outmigration from Canada's northern communities. This gap in the literature is tied to the historical absence of data sources that could support regional analyses of transfer student flows at the sub-provincial level in most Canadian provinces (Pizarro Milian, 2022).

This study fills this identified gap in the existing literature, bringing the field of regional studies[2] into direct conversation with a disconnected but pertinent strand of PSE research. To do so, we draw on newly available administrative linkages within Statistics Canada's Education and Labour Market Linkage Platform (ELMLP), which offers census-level coverage of the PSE student population, as well as authoritative information on students' socio-economic backgrounds. We use these data to statistically model the correlates of Ontario PSE students travelling three PSE pathways during their first two years of study: (1) *no transfer*—a student does not switch institutions, (2) *within region transfer*—a student transfers to another institution within the same geographical region, and (3) *cross-region transfer*—a student transfers to an institution outside of the region of their original choice. The primary findings produced through our analyses are of relevance to both academic and policy audiences. Most notably, we see that northern students are considerably more likely to transfer to a college or university outside of their region than their southern counterparts. In doing so, we conclude that estimated imbalances in cross-region transfer flows in Ontario serve as an additional impediment to the prosperity of northern communities. Indeed, achieving parity in cross-region transfer flows would result in a major influx of students—and prospective long-

2   We use this term broadly to encompass connected research within the fields of rural sociology and education (e.g., Corbett, 2007), northern studies (e.g., Coates & Morrison, 1992), as well as geography (e.g., Sa et al., 2004).

term residents—into northern communities. We elaborate on several strategies that could be deployed by both the provincial government and northern PSE organizations to capitalize on the opportunity to recruit more southern transfer students.

## Regional Dynamics in Transfer Flows within Ontario, Canada

Numerous studies have explored how geography shapes student or youth trajectories. One group of scholars has sought to understand this issue by exploring how spatial distance corresponds with the odds of attending post-secondary education (PSE), or entering specific sectors within it (e.g., Frenette, 2004, 2006, 2009; Gibbons & Vignoles, 2012; Spiess & Wrohlich, 2010; Suhonen, 2014). A second group of scholars (e.g., Corbett, 2005, 2007; Harling Stalker & Phyne, 2014; Karabanow et al., 2014; Looker & Naylor, 2009; Ulrich-Schad et al., 2013) has sought to understand more broadly—mainly through qualitative means—how youth in remote communities (e.g., northern, rural, or coastal) make sense of their decision to either stay in or leave their communities. But, to our knowledge, no existing peer-reviewed studies have devoted similar attention to the regional dimensions of student mobility within PSE, either in Ontario or in other Canadian provinces.

Most of what we know about the intersections of transfer and geography within Ontario is scavenged from policy reports that cover the topic only in passing. Decock's (2006) doctoral thesis on college-to-university transfer in Ontario using the College Graduate KPI survey (1999–2004) contained a table noting that most college-to-university transfers remained within the same city (p. 157). Hence, for example, 73.1% of Algonquin College graduates that enrolled at a university within six months did so at the nearby University of Ottawa, and 79.4% of George Brown College graduates enrolled at either Ryerson University (now Toronto Metropolitan University), University of Toronto, or York University. These patterns led Decock (2006) to conclude that college-to-university transfer students generally "attend universities closest in geographic proximity" (p. 158). This work provides a first piece of evidence suggesting that transfer in Ontario is mostly local and perhaps not a driving force behind cross-region youth migration. However, it is important to note that regional flows were not a focal point of Decock's (2006) early work.

Later research by Decock and his colleagues (2011)

using more recent College Graduate KPI survey data (2001–2007) reached similar conclusions as his earlier publication, noting that:

> college graduates are attending university within the same region as the college from which they completed their studies, likely a function of a desire to stay close to home as well as regional transfer agreements. The numerical split shows that 64 per cent stay within the region while the remaining 36 per cent enroll at a university in another region. (p. 31)

However, the report did detail that across every year covered by their data, the percentage of transfers originating from colleges in the provincial north was consistently the highest in the province (Decock et al., 2011, pp. 14–16). At the same time, the biggest receivers of community college transfers in the province—including York, Ryerson, Ottawa, Western, and Windsor—were all universities situated in the provincial south. These patterns replicated themselves in McCloy et al.'s (2017) research—also drawing on the College Graduate KPI survey data (2007–2015)—which found that Ontario universities with the largest number of incoming college transfers (including York, Ryerson, Ottawa, Ontario Tech, and Brock) were in the southern and more urbanized region of the province. Indeed, McCloy et al. (2017) observed that universities in the Metro Toronto area received far more than a third of all college-to-university transfer in the province. Such patterns hint at the potential for north-south imbalances to exist in PSE student flows across the province.

Further, analyses of administrative data compiled by the Ontario College Application Service (OCAS), representing 22 Ontario colleges, have also shown that most transfers into the community college sector originate from another PSE institution within the same geographical region (Durham College, 2016). Interestingly, those students transferring from northern colleges were the least likely to remain within their region (55%) when compared to counterparts transferring from central (65%), eastern (62%), and western (69%) provincial regions (Durham College, 2016, p. 35). Again, these patterns hint at potential regional imbalances in transfer student flows.

Complementing the provincial-level trends noted above has been work (McCloy et al., 2017) focusing on Seneca College (located in Toronto, ON), which has observed that the majority (79.1%) of graduates that transferred from that institution eventually headed to universities within the Toronto region, or nearby central Ontario region (5.6%),

with very few choosing universities in the north (3.8%), east (2%), or southwestern (3.7%) provincial regions, and virtually none moving out of province. With respects to specific receiving universities, Seneca graduates showed a strong preference for proximate institutions within the Toronto region, including York, Ryerson, and the University of Toronto.

The above-mentioned evidence has spurred consensus that transfer is a local phenomenon, with policy reports routinely assuming that there is a propensity for students to seek to transfer "within their own region" (Trick, 2016, p. 34). However, the available evidence does not provide the optimal evidentiary foundation for such generalizations. First, the bulk of the available analyses of this topic draw on the College Graduate KPI survey, which only captures those who transfer within six months of graduating from college. This obviously excludes all those that transfer after six months, as well as those that transfer prior to graduating. American research shows us that the latter is a sizeable group, and thus raises questions about the pathways taken by this population in Ontario (Wang et al., 2017; Johnson & Muse, 2012). Second, none of the studies cited above draw on population-level data, focusing either on community college graduates (e.g., Decock et al., 2011) or community college applicants (Durham College, 2016). As such, there has been no systematic mapping of regional transfer flows across all plausible pathways, many of which are just as commonly traversed as vertical transfer (Zarifa et al., 2020). Third, no existing study has statistically modelled the uptake of within- or cross-region transfer trajectories, relying exclusively on descriptive statistics. As such, they provide no insights into the correlates of these disparate regional flows, nor whether there are disparities in the estimated adjusted likelihood that students in northern and southern regions will engage in out-migration. This is understandable, given that existing studies have only addressed this topic in passing. Through this study, we overcome all the above-mentioned limitations within the existing literature.

## Theory

We theorize, as done elsewhere (Sano et al., forthcoming), that there will be notable disparities in the PSE pathways travelled by northern and southern students given the differential local forces that impinge on student decision making. Drawing on the qualitative literature on rural youths' decision making (e.g., Tickamyer & Duncan, 1990), as well as empirical analyses of the organizational structure of Ontario PSE (e.g., Weingarten et al., 2013), we outline three

primary forces that are likely to render youth in northern Ontario more likely to migrate south via transfer pathways.

First, Ontario PSE students wishing to transfer into another program will be met with a smorgasbord of prospective options, most of which will be offered by PSE organizations in the provincial south. The *giants* of the Ontario university sector—such as University of Toronto, Toronto Metropolitan University (formerly Ryerson), and York University—offer far more programmatic diversity than "minnows" in the north, such as Algoma or Nipissing (Weingarten et al., 2013). The same pattern replicates itself within the college sector, with the likes of Humber, Sheridan, and Seneca greatly exceeding the size and programmatic diversity of counterparts in the north, such as Boréal or Canadore (Kaufman et al., 2018).

Second, rural sociologists have long accepted that local labour market *opportunity structures* shape not only out-migration, but also, familial investments in human capital and training (Tickamyer & Duncan, 1990; also see Roscigno & Crowle, 2009; Roscigno et al., 2006). Within northern Ontario, as in other Canada provinces, the economy remains dependent on primary resource sectors, such as forestry and mining, despite considerable efforts by multiple levels of government to diversify these economies. Meanwhile, the major urban centres in the southern portion of Ontario are home to the seats of the provincial and federal governments, as well as the national headquarters of major financial institutions, pharmaceutical companies, law firms, and other sectors requiring advanced levels of education. The geographic layout of these opportunity structures has been found to drive the decision making of rural youth both in Canada (e.g., Corbett, 2009) and the United States (e.g., Nelson, 2019), and we expect that they will "pull" south a disproportionate share of northern transfer students.

Third, scholars have long noted the allure of various types of amenities within large urban centres, ranging from public services (e.g., schools, hospitals) to consumer services (e.g., restaurants, theatres) (e.g., Glaeser et al., 2001; Rosenthal & Strange, 2004). In addition, evidence suggests that those cities containing a healthy concentration of these amenities have grown faster in recent history. Moreover, we have seen traces of the influence of such amenities in the decision making of rural youth contemplating out-migration (e.g., Bæck, 2004; Corbett, 2009). Here, we once again expect that the concentration of these amenities in cities within southern Ontario will serve as a draw card that will pull northern PSE students south.

Together, we surmise that these forces will make

northern students that transfer more likely to move outside of their region than southern counterparts. If true, our findings would reveal an additional layer of out-migration from northern, rural communities—one that occurs even after students have begun their PSE journeys.

## Data and Methods

To track student mobility, this study relies on several data sets that are part of Statistics Canada's Education and Labour Market Linkage Platform (ELMLP). Specifically, we employ the Postsecondary Student Information System (PSIS) files, which are created using administrative enrolment data reported by all public colleges and universities in the nation. An obvious strength of this dataset vis-à-vis prominent Canadian PSE surveys is that it provides near census-level coverage of PSE enrolments within Ontario from the academic years of 2009/2010 to 2016/2017. These sample sizes allow for sub-provincial analyses not feasible through the now discontinued Youth in Transition Survey (YITS). Further, and unlike both the YITS and National Graduates Survey, the PSIS contains institutional identifiers that allow us to create northern and southern groupings. A second strength of the PSIS is that it captures student demographics, along with information about the program and institution that students enrolled in every year. They are thus the optimal data source to both track and statistically model student mobility within Ontario PSE. Further bolstering the strengths of the PSIS data are available linkages to family tax files (T1FF) (tax years 2004 to 2015) containing socio-demographic variables of relevance, including parental income, family composition, and family size.

Like Finnie et al., (2020), we restrict our analysis of transfer flows to undergraduate-level students within the PSIS files, excluding students who are enrolled in professional, graduate, and postgraduate programs. Specifically, we select those students who were enrolled in a college or university program during the time of data collection and subsequently followed their institution and sector pathways for two years.[3] This approach has several advantages. First, most transfer activity has been found to occur early

on during the student life course (see Hillman et al., 2008; Johnson & Muse, 2012). Second, this approach maximizes sample sizes vis-à-vis focusing only on graduates, as done in other studies. We adopt this approach and track six different cohorts of students (i.e., 2009–11, 2010–12, 2011–13, 2012–14, 2013–15, and 2014–16). For the 2009 entering cohort, we first compare differences between 2009 and 2010 institution IDs. We then compare 2010 to 2011 institution IDs. We pool information gathered through such comparisons to map three possible trajectories for students—(1) *no transfer*—students do not transfer within two years after their initial enrolment into post-secondary institution (i.e., college or university), (2) *within region*—students transfer to another institution, but stay within the same region, and (3) *cross region*—students transfer to another institution outside of their region. Our final analytical sample consists of 370,650 total students—355,305 in southern institutions and 15,345 students in northern institutions.

In step with prior research, we include demographic, program, and family characteristics in our analysis. First, demographic characteristics include age (0 = younger, 21 or less; 1 = older, 22 or more), sex (0 = males; 1 = females), and the quintiles of gross parental income (0 = lowest; 1 = lower; 2 = middle; 3 = higher; 4 = highest). Second, we include the major field of study initially pursued by students (0 = arts/humanities; 1 = health; 2 = natural sciences; 3 = social sciences; 4 = other).[4] Third, we add family characteristics, such as the number of people in the family (0 = smaller, three or less; 1 = larger, four or more) and family type (0 = two-parent; 1 = lone-parent).

Several limitations of the PSIS are worth noting here. First, early reporting for the PSIS program saw a subset of institutions submit enrolment files with imputed student identifiers. We are thus unable to include students with imputed data in our analyses, as they cannot be tracked across years. Considering that each year contains a different set of imputed institutions, we account for academic year of initial enrolment (0 = 2009; 1 = 2010; 2 = 2011–12; 3 = 2013; 4 = 2014). Further, the PSIS data also lack measures of GPA or student grades to account for academic performance as well as measures of parental expectations or parent education to account for cultural capital effects, nor can we adjust our estimates to account for their various high school

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3    Additional analyses (not shown here) tracked students over four years of time and pool four cohorts of students (e.g., 2009 to 2013; 2010 to 2014; 2011 to 2015; 2012 to 2016), but sample sizes diminished too much over time (due to graduation from college, attrition, drop out, or stop out).

4    Our field of study measure combines both two-digit and four-digit CIP (Classification of Instructional Program) codes (additional details available upon request).

behaviours found to be correlated with pathways elsewhere (Davies & Pizarro Milian, 2020).

Our analytical approach includes both descriptive statistics as well as regression modelling. First, we use univariate analysis to describe the overall pattern of post-secondary transfer types across and within regions separately for northern and southern Ontario. Second, to uncover the characteristics of those who transfer via the various types of PSE pathways, we first estimate an unadjusted pooled multinomial logistic regression (e.g., Long & Freese, 2006) predicting transfer pathway (i.e., no transfer, transfer within the region, and transfer across regions) with only our focal independent variable (e.g., location of study) in the model. Third, we estimate an adjusted pooled multinomial logistic regression model to isolate the relationship between location of study and pathway while simultaneously taking into consideration the effects of various controls. Multinomial logistic regression models serve to provide two important facets of information on the data: (1) to identify which predictors are significantly related to the dependent variable, and (2) to indicate how strong each predictor is relative to others. To improve the interpretability of our main regression results, we also estimate the predicted probabilities and 95% confidence intervals around those estimates for each of the predictors in our models. In addition, to understand prospective differences in the drivers of cross-region transfer in the north and south, we refit our models separately on these two populations. These sub-sample analyses are the equivalent of fitting fully interacted models (using the location of study variable).

## Results

Table 1 contains information on the characteristics of students in our analytic sample, both for the overall model and the regional sub-samples. For brevity, we focus only on the distributions of our dependent variable. Overall, we see that most students in Ontario (92.33%) do not transfer within their first two years of study. And, this figure varies only marginally in either the north (91.17%) or south (92.38%). With respect to those who did transfer, at the provincial level, the prevalence of transferring *within* regions is considerably higher (7.20%) than the level of transfer happening *across* regions (0.46%). However, there is considerable variation in this respect across regions. In the north, students are far more likely to transfer across regions (5.18% vs. 0.26%) and less likely to transfer within regions (3.64% vs. 7.36%) than their southern counterparts. As such, the pro-

vincial-level patterns coincide with observations made in previous studies noting that transfer predominantly occurs among institutions within the same geographical region. Yet, northern students are more likely to buck this trend. The question remains, are northern students statistically more likely to transfer across regions than their southern counterparts once we account for demographic and other differences between them?

To estimate the net relationship between region and transfer pathway, we fit pooled multinomial logistic regressions. Odds ratios from unadjusted and adjusted multinomial logistic regressions are presented in Table 2 for interested readers. To render findings from such model more interpretable, we derive predicted probabilities and 95% confidence intervals and present these in graphical displays. Predicted probabilities, which range from 0 to 1, represent the probability that a student would take one of the various pathways.

Model 1 in Table 2 shows the results from our multinomial logistic regressions predicting the type of pathway taken by a student, while taking only the location of the initial PSE institution attended into account as a predictor. Overall, the results indicate that school location has a statistically significant relationship with pathway uptake. Students from northern Ontario universities and colleges were significantly less likely (OR = 0.50, $p < .001$) to transfer within their regions—relative to the base category of not taking a transfer route—compared to their southern counterparts. However, students from northern Ontario were substantially more likely to transfer across regions of Ontario (OR = 20.17, $p < .001$). Figure 1 displays these estimated differences between southern and northern students in pathway uptake. Overall, southern students have slightly higher predicted probabilities than northern students of not transferring (0.9237 vs. 0.9137). Further, southern students have higher probabilities than northern students of transferring within regions (0.0737 vs. 0.0346), but northern students have considerably higher probabilities of transferring across the regions (0.0518 vs. 0.0026).

In Model 2, we control for a set of theoretically relevant factors that might also account for regional differences in student flows. The introduction of such controls does virtually nothing to disrupt the estimated size of the region coefficient, nor its associated statistical significance level. Northern students remain significantly less likely to transfer within regions of the province (OR = 0.47, $p < .001$), and significantly more likely to transfer across regions of the province (OR = 20.19, $p < .001$). The predicted probabilities that

**Table 1**

*Student Characteristics in the PSIS-T1FF, 2009–2016*

| | | Overall | South | North |
|---|---|---|---|---|
| **Pathway Type** | No transfer | 92.33 | 92.38 | 91.17 |
| | Within region | 7.2 | 7.36 | 0.364 |
| | Across region | 0.46 | 0.26 | 5.18 |
| **Location of School** | South | 95.86 | . | . |
| | North | 4.14 | . | . |
| **Sex** | Men | 45.59 | 45.85 | 39.5 |
| | Female | 54.41 | 54.15 | 60.5 |
| **Age** | ≤18 | 54.33 | 54.54 | 49.51 |
| | 19 | 26.34 | 26.31 | 27.1 |
| | 20 | 12.48 | 12.43 | 13.62 |
| | 21 | 6.85 | 6.73 | 9.77 |
| **Parental Income** | Lowest | 18.35 | 18.64 | 11.67 |
| | Lower | 19.59 | 19.66 | 17.8 |
| | Middle | 20.19 | 19.97 | 25.42 |
| | Higher | 20.72 | 20.44 | 27.38 |
| | Highest | 21.15 | 21.29 | 17.73 |
| **Type of Institution** | University | 82.93 | 82.93 | 82.86 |
| | College | 17.07 | 17.07 | 17.14 |
| **Registration Status** | Full-time | 97.4 | 97.38 | 97.72 |
| | Part-time | 2.6 | 2.62 | 2.28 |
| **Field of Study** | Arts/humanities | 19.67 | 20 | 12.06 |
| | Health | 11.31 | 10.84 | 22.23 |
| | Natural sciences | 27.17 | 27.48 | 19.95 |
| | Social sciences | 37.91 | 38.39 | 26.73 |
| | Other | 3.94 | 3.29 | 19.04 |
| **Size of Household** | ≤2 | 27 | 88.38 | 86.83 |
| | >2 | 73 | 11.62 | 13.17 |
| **Family Composition** | Couple | 88.32 | 26.96 | 28.01 |
| | Lone | 11.68 | 73.04 | 71.99 |

|  |  | Overall | South | North |
|---|---|---|---|---|
| **Year of Enrolment** | 2008 | 15.5 | 15.43 | 17 |
|  | 2009 | 16.81 | 16.77 | 17.65 |
|  | 2010 | 16.84 | 16.86 | 16.42 |
|  | 2011 | 16.79 | 16.82 | 15.9 |
|  | 2012 | 17.38 | 17.39 | 17 |
|  | 2013 | 16.69 | 16.72 | 16.03 |
| **Total** |  | 370,650 | 355,305 | 15,345 |

**Table 2**

*Multinomial Logistic Regression Analysis Predicting Pathway Type among Students, Ontario. PSIS-T1FF 2009–2016.*

|  | Model 1 | | Model 2 | |
|---|---|---|---|---|
|  | Within | Across | Within | Across |
| **Location of school** |  |  |  |  |
| South | - | - | - | - |
| North | 0.50*** | 20.17*** | 0.47*** | 20.19*** |
| **Sex** |  |  |  |  |
| Men |  |  | - | - |
| Women |  |  | 0.47*** | 1.25*** |
| **Age** |  |  |  |  |
| ≤18 |  |  | - | - |
| 19 |  |  | 1.00 | 1.01 |
| 20 |  |  | 0.87*** | 0.99 |
| 21 |  |  | 0.97 | 1.18 |
| **Parental income** |  |  |  |  |
| Lowest |  |  | - | - |
| Lower |  |  | 1.00 | 1.20* |
| Middle |  |  | 0.97 | 1.29** |
| Higher |  |  | 0.99 | 1.47*** |
| Highest |  |  | 0.91*** | 1.53*** |
| **Type of institution** |  |  |  |  |
| University |  |  | - | - |
| College |  |  | 4.41*** | 4.21*** |

| | Model 1 | | Model 2 | |
|---|---|---|---|---|
| | Within | Across | Within | Across |
| **Registration status** | | | | |
| Full-time | | | - | - |
| Part-time | | | 2.44*** | 1.91*** |
| **Field of study** | | | | |
| Arts/humanities | | | - | - |
| Health | | | 0.84*** | 0.91 |
| Natural sciences | | | 0.57*** | 0.88 |
| Social sciences | | | 0.81*** | 1.05 |
| Other | | | 1.20*** | 0.87 |
| **Size of household** | | | | |
| ≤2 | | | - | - |
| >2 | | | 1.05*** | 0.99 |
| **Family composition** | | | | |
| Couple | | | - | - |
| Lone | | | 1.10*** | 1.19* |
| **Year of enrolment** | | | | |
| 2008 | | | - | - |
| 2009 | | | 1.02 | 0.92 |
| 2010 | | | 0.97 | 0.97 |
| 2011 | | | 0.89*** | 1.06 |
| 2012 | | | 0.92*** | 1.10 |
| 2013 | | | 0.72*** | 1.08 |
| LR chi-square | 3114.89*** | | 18262.03*** | |
| Pseudo r-square | 0.0146 | | 0.0855 | |
| Log likelihood | -105222.57 | | -97648.998 | |

*$p < 0.1$, **$p < 0.05$, ***$p < 0.01$; No transfer is the reference category for the dependent variable

correspond to this model are visualized in Figure 2 and are virtually indistinguishable from those in Figure 1.

Several of the relationships observed between our controls and dependent variable are worth mentioning. In terms of sex, female students show higher odds of transferring across regions (OR = 1.25, $p < 0.001$) and lower odds of transferring within the region (OR = 0.47, $p < 0.001$) than their male counterparts when compared to the non-transfer route. For age, students who were 20 (compared to those 18 and under) are slightly less likely to transfer within the region (OR = 0.87, $p < 0.01$), but no significant differences emerge in their likelihood of transferring across the regions. For parental income, those from the highest income category are significantly less likely to transfer within regions compared to those from the lowest income category. Higher parental income also appears to be positively associated with a higher likelihood of transferring across the region, as the odds of transferring across regions increases with higher parental

**Figure 1**

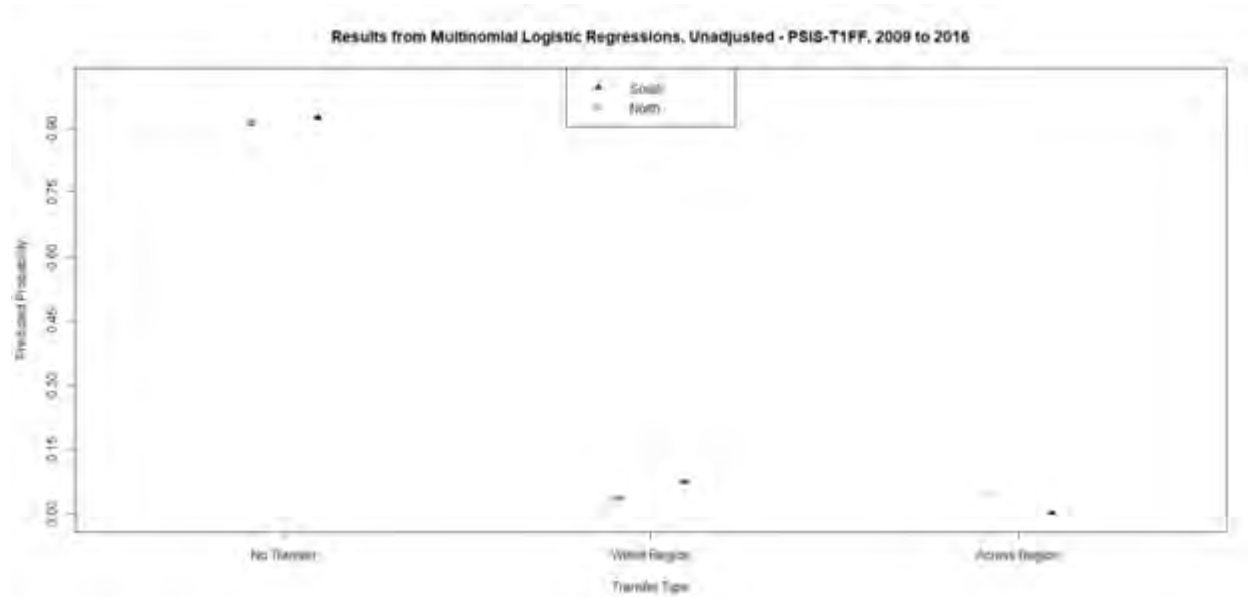*Predicted Probabilities of Pathway Type by Region of Institution (Unadjusted). PSIS-T1FF 2009–2016*



**Figure 2**

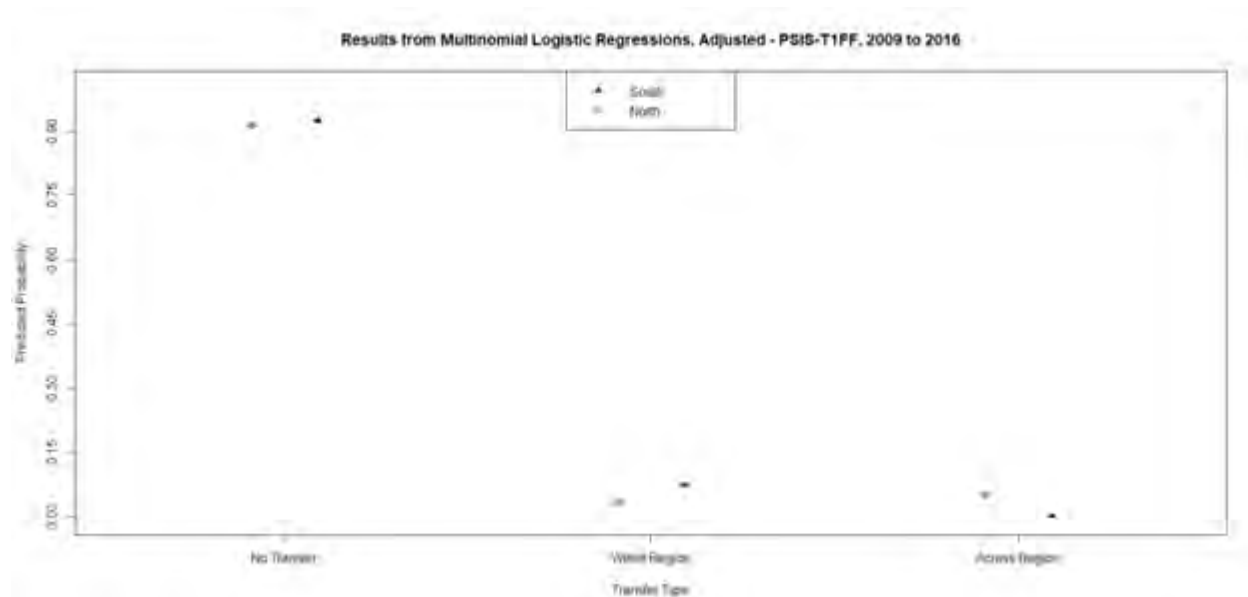*Predicted Probabilities of Pathway Type by Region of Institution (Adjusted). PSIS-T1FF 2009–2016*

**Figure 3**

*Predicted Probabilities of Pathway Type by Type of Institution (Adjusted). PSIS-T1FF 2009–2016*
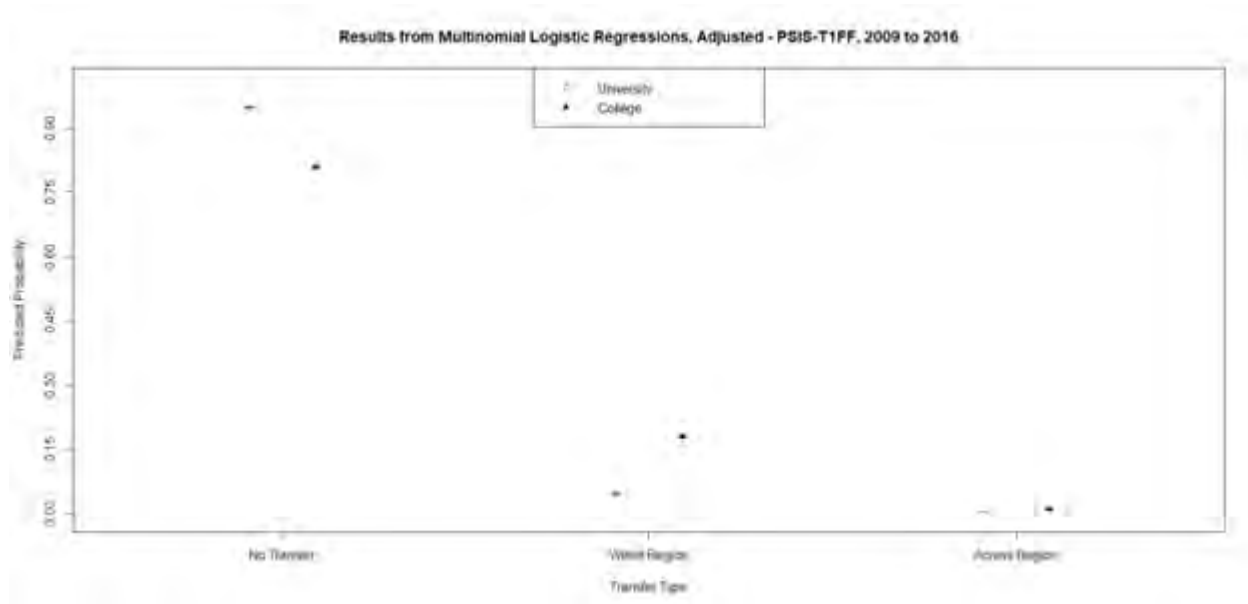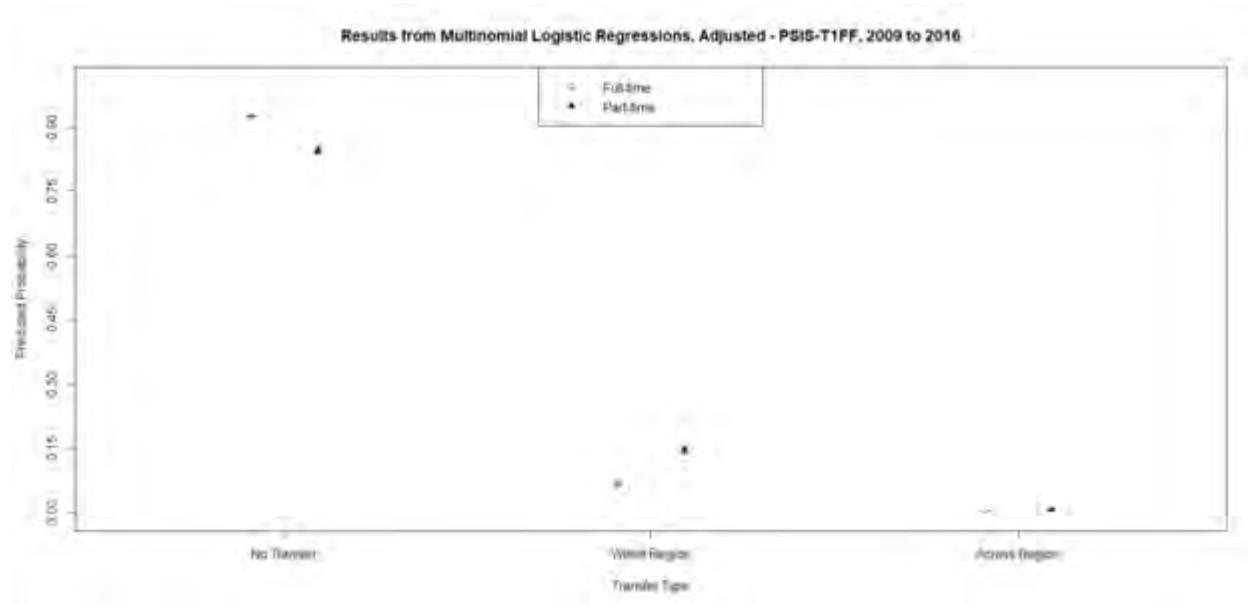


**Figure 4**

*Predicted Probabilities of Pathway Type by Registration Status (Adjusted). PSIS-T1FF 2009–2016*

income categories.

Interestingly, our results also show some sizeable differences across students starting their education at colleges and universities, as well as those with differing registration statuses. Compared to university students, college students are significantly more likely to transfer within the region (OR = 4.41, $p < 0.001$) and across the region (OR = 4.21, $p < 0.001$). Visually, Figure 3 shows that university students have higher probabilities than college students of not transferring (0.9481 vs. 0.8081). At the same time, college students have higher probabilities than university students in transferring within (0.1803 vs. 0.0486) and across the region (0.0033 vs. 0.0116).

The role of registration status on transfer pathway uptake also shows statistically significant differences. Compared to full-time students, part-time students are significantly more likely to transfer both within the region (OR = 2.44, $p < 0.001$) and across the region (OR = 1.91, $p < 0.001$) than to take the non-transfer route. In Figure 4, when graphing the predicted probabilities, full-time students show higher probabilities of not transferring (0.9255 vs. 0.8453) whereas part-time students show considerably higher probabilities on both types of transfer. Further, the gap between part-time and full-time students is considerably larger for both non-transfer as well as within-region transfer patterns in comparison to across-region transfer.

Finally, in terms of field of study, compared to students majoring in arts and humanities, those majoring in health (OR = 0.84, $p < 0.001$), natural sciences (OR = 0.57, $p < 0.001$), and social sciences (OR = 0.81, $p < 0.001$) have lower odds of transferring within the region over taking the non-transfer route. Interestingly, no significant differences emerge when examining field of study and transfer across the region.

In Table 3, we refit our main multinomial logistic regression model separately on the sub-samples of northern and southern students. This allows us to observe notable regional variation in the correlates of the two transfer pathways. We see that women are more likely than men to travel both transfer pathways in the south ($p < .001$), but not the north. Age also has a statistically significant relationship with transfer—mainly within region—in the south, but not the north. Further, we see that parental income is associated with cross-region transfer among southern students, with those in the three highest income quintiles being more likely than those in the lowest quintile to transfer out of region ($p < .001$). Again, no such relationship is observed in the north. Field of study is also an important driver of transfer in both

regions, but coefficients at times vary in their strength and the direction of their sign. In both regions, students in health or natural sciences programs are less likely than the reference category to engage in within region transfer ($p < .001$). But, in the south, students in these programs are more likely to transfer across regions ($p < .001$). The same is not true in the north. On the other hand, in both regions, college students are found to be more likely to transfer than their university counterparts, particularly within region ($p < .001$). And, in the north, college students are also found to be more likely to engage in cross-region transfer ($p < .001$). Overall, these sub-sample analyses lead us to conclude that despite some similarities, the drivers of transfer are quite different in the southern and northern regions of Ontario.

## Discussion

This article provides the first comprehensive and multivariate empirical assessment of regional dynamics in transfer student flows within Ontario, Canada. In doing so, it presents the first analysis of its kind within the North American transfer literature and answers several key questions of considerable importance to various academic and policy audiences. Below, we detail a subset of these key insights and conclude by identifying fruitful directions for future research.

Our finding that northern students are more likely to transfer south—net of all available controls—is consistent with previous research that has identified sizeable youth out-migration from diverse remote Canadian communities at various points in the life course (e.g., Corbett, 2007; Dowsley & Southcott, 2017). Though our methods do not allow us to pinpoint why, there are a combination of forces that are disproportionately driving northern students to transfer south. Proportionally, we do not see the same transfer flows coming north. Now, it is important to recognize that, given the imbalanced size of the northern and southern populations, the regional interchange of transfer students during the period covered by our data nonetheless resulted in a net inflow of roughly 129 students to the north. However, this should not stop us from considering the benefits to northern communities that could be achieved through proportional parity in transfer flows. Consider these two hypothetical scenarios. If northern students transferred out of region at the same low rate (0.26%) as their southern counterparts—perhaps driven by bolstered efforts to retain them in northern colleges and universities—this would result in an 884

**Table 3**

*Multinomial Regression Analysis Predicting Pathway Type among Southern and Northern Students Separately, Ontario. PSIS-T1FF 2009–2016.*

| | South | | North | |
|---|---|---|---|---|
| | Within | Across | Within | Across |
| **Sex** | | | | |
| Men | - | - | - | - |
| Women | 1.07*** | 1.41*** | 1.07 | 1.09 |
| **Age** | | | | |
| ≤18 | - | - | - | - |
| 19 | 1.05*** | 0.90 | 1.15 | 1.09 |
| 20 | 0.92*** | 1.00 | 1.17 | 0.92 |
| 21 | 1.06** | 1.29* | 0.80 | 0.96 |
| **Parental income** | | | | |
| Lowest | - | - | - | - |
| Lower | 1.01 | 1.28* | 0.86 | 0.98 |
| Middle | 1.00 | 1.63*** | 0.96 | 0.96 |
| Higher | 1.02 | 2.01*** | 1.01 | 0.92 |
| Highest | 0.94** | 1.86*** | 1.04 | 1.09 |
| **Institution Type** | | | | |
| University | - | - | - | - |
| College | 4.07*** | 4.84 | 7.12*** | 3.35*** |
| **Registration status** | | | | |
| Full-time | - | - | - | - |
| Part-time | 1.97*** | 1.39 | 1.02 | 1.35* |
| **Field of study** | | | | |
| Arts/humanities | - | - | - | - |
| Health | 0.81*** | 1.49*** | 0.42*** | 0.54*** |
| Natural sciences | 0.55*** | 1.26* | 0.57*** | 0.55*** |
| Social sciences | 1.02*** | 1.30** | 0.97 | 0.87 |
| Other | 0.94*** | 1.86*** | 0.50*** | 0.56*** |
| **Household size** | | | | |
| ≤2 | - | - | - | - |
| >2 | 1.11*** | 0.92 | 1.10 | 1.20* |

| | South | | North | |
|---|---|---|---|---|
| | Within | Across | Within | Across |
| **Family composition** | | | | |
| Couple | - | - | - | - |
| Lone | 1.12*** | 1.25* | 1.31* | 1.12 |
| **Year of enrolment** | | | | |
| 2008 | - | - | - | - |
| 2009 | 1.00 | 0.90 | 1.01 | 0.98 |
| 2010 | 0.96 | 0.87 | 0.97 | 1.15 |
| 2011 | 0.89*** | 1.07 | 0.82 | 0.98 |
| 2012 | 0.92*** | 1.05 | 1.03 | 1.23 |
| 2013 | 0.73*** | 0.90 | 1.14 | 1.43** |
| LR chi-square | 16692.61*** | | 797.70*** | |
| Pseudo r-square | 0.0711 | | 0.0608 | |
| Log likelihood | -108978.16 | | -6159.9578 | |

*$p < 0.05$, **$p < 0.01$, ***$p < 0.001$

net inflow of transfer students into the north.[5] In a second hypothetical, southern students transferred across regions at the same rate (5.18%) as their northern counterparts—driven by strategic efforts to render transferring north more appealing to them—this would result in a more than 17,000 inflow of transfer students into northern communities.[6] Over the long term, these sizeable influxes of students could revitalize northern communities now accustomed to seeing their youngest and most talented leave to pursue opportunities in the south. Those coming north could include future professionals in education (e.g., teachers), health (e.g., nurses,), and social work, all of which are sorely needed in the north. In remote northern communities, even a handful of these individuals can have a drastic effect on the quality and availability of social services.

Knowing that retention and transfer student recruitment could have such a drastic effect on northern communities, it is natural to question what type of strategies could be adopted to improve these processes. Now, given that our work does not allow us to ascertain what prompted students to transfer south, some of our suggestions are largely speculative but nonetheless worth considering. First, research tells us that 43% of Ontario university transfer students move into a different discipline or program area (Finnie et al., 2020). If northern students are driven south by the availability of programs (e.g., science, engineering) with only limited capacity to absorb them in northern institutions, the natural solution to improve retention would be for the province to augment funding to render those programs available locally. On the other hand, addressing "push" factors in the north outside of PSE, such as the availability and quality of jobs, is not something we have simple solution to. Second, and with respect to recruiting transfer students from the south, a simple solution to make the north a more appealing destination is for colleges and universities in the region to offer more generous amounts of transfer credit. It would be reasonable to expect that—if northern colleges/universities offer a relatively shorter pathway to graduation for prospective transfers—the potential savings in time and money will draw a larger share of students northward to complete their studies. In turn, the provincial government could incentiv-

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5   To arrive at this figure, we simply multiplied the cross-region transfer rate of the southern population (.28%) by the size of the northern student population (15,345).

6   Again, here we multiplied the cross-region transfer rate of the northern population (5.18%) by the size of the southern population (355,305).

ize this behaviour, nudging northern institutions to be more generous transfer credit granters, by altering its funding formula to provide greater per-student support based on the amount of transfer credit awarded. ONCAT could also work to support the creation of more articulated pathways from southern to northern institutions. The most effective strategies to maximize net transfer flows into the north will likely require a combination of tactics, along with the buy-in of all participating parties.

Empirically examining the above-mentioned and other potential mechanisms behind regional disparities in cross-region transfer will generate the type of intelligence needed to inform strategies to retain students in the provincial north. This is evidence that will need to be gathered through a mixture of survey- and interview-based methods for us to be able to develop a more nuanced understanding of student decision making. One promising data source for such analyses—assuming that northern sample sizes will be sufficiently large—is a recent Transfer Intent Survey launched by ONCAT in the fall of 2021, but not yet publicly available. This survey captures key information not only on the demographic characteristics of transfer intending students, but also, catalogues key information about the factors driving transfer behaviour. Contrasting the latter information by respondents' region of residence could render very useful intelligence.

The discussion above encourages us to dive "deeper" to better understand the causal mechanisms behind statistical patterns observed through our analysis. However, future research should also push us in two distinct directions. First, how do transfer patterns vary within regions? The provincial south and north are quite diverse in their composition, and out-migration could look quite different in Toronto relative to London, or in North Bay compared to Thunder Bay. Where sample sizes support said analyses, future work using more granular regional categories—such as southwest, central, east, and north—should be undertaken. In other work, we have detected important differences across said regions with respect to vertical transfer intent (Pizarro Milian et al., 2022), so it is certainly possible that our use of broader north/south groupings paints over some meaningful fluctuations in mobility within the south. Beyond focusing on more granular sub-provincial regions, it would also be worthwhile to explore disparities between rural and urbanized areas of each of these regions, as studies have repeatedly found that students in rural areas are particularly disadvantaged when it comes to PSE participation and other outcomes (e.g., Zarifa et al., 2018). Relatedly, future

work should experiment with the use of more refined metrics capturing the distance between a student's residence or school and available transfer partners. These more refined metrics have proven important predictors of PSE participation in several Canadian studies (Frenette, 2004, 2006) and could help us to better understand the relationship between geography or remoteness and student mobility within our vast province. Though outside of the scope of the presented analyses, each of these serves as exciting opportunities for future work.

A second important line of inquiry: it is necessary to understand regional dynamics from a comparative perspective. How do observed patterns in Ontario compare to those in other Canadian provinces, along with comparable American states? The former analysis is already feasible through leveraging PSIS files for other provinces within the ELMLP. It would be particularly interesting to contrast Ontario with jurisdictions like Alberta and British Columbia who have far more mature transfer systems (Pizarro Milian & Munro, 2020), but similarly stark regional disparities between their southern urban hubs (e.g., Calgary, Vancouver) and remote northern regions. Contrasts with American counterparts are obviously more difficult given differences in the available data, but the neighbouring states of Michigan and New York could provide interesting reference points for trends in Ontario if comparable data could be acquired. Through these and other comparisons, it may be possible to arrive at general regional dynamics that play out through the PSE trajectories of students from remote communities in various regions.

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