

COLLEGE STUDENT SUCCESS
INNOVATION CENTRE

Proactive Advising

A Report on Student Retention Outcomes

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Executive Summary

In 2017, Mohawk College and the Education Policy Research Initiative (EPRI) developed, implemented, and evaluated a proactive advising initiative to examine its effects on student outcomes, including retention and participation in regular advising services. Two models for proactive advising delivery, group advising and one-to-one advising, were evaluated using a randomized controlled trial setting. This pilot study found that group advising has positive intention-to-treat (ITT) effects (i.e., the effect of simply being assigned to one of the treatment groups) and also positive average treatment effects on the treated (ATET) (i.e., representing the effect of actually participating in the treatment) on student retention overall. The effects are, however, not consistent for male and female students, with assignment to both group and one-to-one advising found to improve retention for male students, but not for female students (Finnie et al., 2017).

To further build evidence on the validity of the results of this pilot and to explore whether the results generalize to other colleges in Ontario, Mohawk College, through their new College Student Success Innovation Centre (CSSIC), called for partners to participate in a replication study. Three colleges were selected to participate: Centennial College, Fleming College, and Humber College. This report presents findings for the effects of the proactive group and one-to-one advising interventions on student retention from their first to second term (i.e., one-term retention) for first-year full-time students entering their programs in the fall of 2019, again presenting both ITT and ATET effects.

Mirroring the methods and procedures used in the pilot study, incoming students were randomly assigned to one of three equally sized groups: control group, group advising, and one-to-one advising. Students in the control group were contacted via email before the first day of class and informed about the regular advising services that were available to them. The two treatment groups were instead actively encouraged to participate specifically in a group advising session or a one-to-one advising session before the beginning of the fall semester. If students in the treatment groups had not booked an advising appointment within a specific time period after receiving the invitation email, the colleges sent email reminders and ran call campaigns to remind them to do so. In contrast, there was no follow-up communication for the control group after the initial contact.

To ensure as much uniformity across sites and consistency with the Mohawk pilot project as possible, Mohawk College provided partners with funding and ensured overall project coordination, as well as communication templates and the agenda of advising sessions developed during the pilot study.

Overall, we find that students assigned to the one-to-one advising group have higher take-up rates (between 13% to 22%) than those assigned to group advising (between 8% to 14%), and that advising take-up rates are lower for male than for female students.

In this study, a retention outcome is used to evaluate the effectiveness of proactive advising, specifically, one-term leaving, which captures whether a student enrolled on the tenth day of the Fall 2019 semester is still enrolled on the tenth day of the following Winter semester. The analysis is conducted separately for each participating college as well as together for the entire sample across all colleges (using both weighted and unweighted approaches). For each sample, the results are presented for the full sample and then separately for male and female students. Two regression modelling approaches are employed to identify the average effects: one that uses no controls, which roughly

corresponds to a simple comparison of the one-term leaving rates across the three assignment groups, and another regression that controls for gender, age, high school GPA, field of study, and credential type.

After analyzing the findings for the intention-to-treat (ITT) effect and the average treatment effect on the treated (ATET), we are unable to find any evidence that the proactive advising initiative has a statistically significant positive effect on student retention (i.e., student leaving) either overall or at any particular participating college. Although we observe that the one-term leaving rates of most of the treatment groups are lower compared to the control groups, many of these differences are very small and none of the estimates are statistically significant at even the 10% level.

There are multiple possible factors that could contribute to the absence of statistically significant effects in this replication study. These include any potential difference in the advising services ultimately offered; the relatively small sample sizes; the low proactive advising take-up rates; the fact that some one-term leaving rates were already low to begin with, leaving little room for the initiative to improve retention; or unobservable differences across the three assignment groups. This analysis is not able to say whether any of these potential factors contributed to the findings reported.

Identifying the underlying factors associated with the effectiveness of the proactive advising interventions at Mohawk College, if possible with further analysis, might help improve our understanding of the Mohawk findings as well as the those reported here, and inform us regarding the potential generalizability of the proactive advising interventions. Perhaps, for example, more precisely identifying specific target groups could point towards where the advising might be most effective.

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1. Introduction

Improving student retention is one of the most important and difficult problems that post-secondary institutions face. There are a wide variety of programs and services to support students' transition into post secondary education (PSE) and promote student success. In particular, one strategy to demonstrate interest and care for students, to engage students in purposeful discussion related to their academic planning, to strategically provide student information, and to help them avoid problems is through proactive advising. In essence, this approach entails providing information or support to students before they need it through institution-initiated contact.

The effectiveness of proactive advising in improving student outcomes has been widely examined in American literature. These include studies focusing on incoming students (e.g., Backhus, 1989; Glennen & Baxley, 1985; Rodgers, Blunt, & Tribble, 2014; Ryan & Glenn, 2003), on academically unprepared students (e.g., Rodgers et al., 2014), on students on academic probation (e.g., Abelman & Molina, 2001), and on Indigenous students (Finnie et al., 2019). Inconsistent results are found across gender (Finnie et al., 2017), across discipline (Mooring, 2015), and by the period across which persistence is measured (Schwebel et al., 2012). However, until the first half of the 2010s, there was little literature examining the effects of proactive advising at Canadian universities or colleges.

In 2017, Mohawk College and the Education Policy Research Initiative (EPRI) – a research organization based at the University of Ottawa – developed, implemented, and evaluated a proactive advising initiative to examine its effects on student outcomes, including retention and participation in regular advising services.¹ The pilot study found that proactive advising improved student retention at Mohawk College (Finnie et al, 2017).

To further build evidence on the validity of the results of this pilot and to explore whether the results generalize to other colleges in Ontario, Mohawk College, through their new College Student Success Innovation Centre (CSSIC), called for partners to participate in a replication study. Three colleges were selected to participate: Centennial College, Fleming College, and Humber College.

This report focuses on the evaluation of the effectiveness of proactive advising – specifically two approaches: group advising and one-to-one advising – in improving student retention from the first to second term (i.e., one-term retention). Mirroring the methods and procedures used in the pilot study, the experiment was conducted using a randomized controlled trial (RCT) setting to investigate whether students at the three participating colleges who were offered proactive advising services had a lower probability of leaving within one term compared to the control group.

While the proactive advising pilot study generated promising results, we are unable to find any evidence that the proactive advising initiative has a statistically significant positive effect on student retention (i.e., student leaving) either overall or at any particular participating college. Although we observe that the one-term leaving rates of most of the treatment groups are lower compared to the control groups, many of these differences are very small and none of the estimates are statistically significant at even the 10% level.

¹ The pilot project was conducted with financial support from the Higher Education Quality Council of Ontario.

There are multiple possible factors that could contribute to the absence of statistically significant effects in this replication study. These include any potential difference in the advising services ultimately offered; the relatively small sample sizes; the low proactive advising take-up rates; the fact that some one-term leaving rates were already low to begin with, leaving little room for the initiative to improve retention; or unobservable differences across the three assignment groups. This analysis is not able to say whether any of these potential factors contributed to the findings reported.

Our replication study parallels a four-year project called Monitoring Advising Analytics to Promote Success (MAAPS) which started in 2016 in the U.S. This project tracks approximately 10,000 low-income and first-generation freshmen across eleven public universities to examine the effects of the MAAPS advising intervention.² Their results also point to inconsistency in the effectiveness of advising interventions on student outcomes across sites in both the short-term (one year) and the medium-term (two years and half), that is, the positive ITT effects are observed at a few institutions, but do not generalize to all institutions or the aggregate sample (Alamuddin, Rossman, & Kurzweil, 2018 & 2019).

Identifying the underlying factors associated with the effectiveness of the proactive advising interventions at Mohawk College, if possible with further analysis, might help improve our understanding of the Mohawk findings as well as the those reported here, and inform us regarding the potential generalizability of the proactive advising interventions. Perhaps, for example, more precisely identifying specific target groups could point towards where the advising might be most effective.

This report outlines the background of the project, the methodology, and the findings in six sections. Section 2 provides a summary of the Mohawk College pilot study as well as an overview of the replication study. Section 3 describes the experimental design, the data, and the methodology. The results are reported in section 4. Finally, section 5 concludes the report with a discussion of the results and the generalizability of the findings of the pilot to other colleges in Ontario, followed by suggestions for future work.

2. Background

2.1 Mohawk College Pilot Study

In 2015, Mohawk College and EPRI developed a proactive advising (PA) initiative funded by the Higher Education Quality Council of Ontario (HEQCO) as part of their Access and Retention Consortium (ARC) in an attempt to improve first-term and first-year retention at the college.

Simply put, proactive advising is exactly what it sounds like, providing information and support to students (i.e., advising students) before they seek or ask for it (i.e., proactively). It is a deliberate outreach intervention aimed at enhancing student motivation and engagement, and building strong relationships with students.

There are different ways to implement PA in a post-secondary institution. Conscious of that fact and determined to find the most efficient and cost-effective way to implement PA, the pilot project adopted a dual approach:

² They are Arizona State University, Georgia State University, Iowa State University, Michigan State University, The Ohio State University, Oregon State University, Purdue University, University of California Riverside, University of Central Florida, University of Kansas, and University of Texas at Austin. These eleven universities constitute the University Innovation Alliance.

- the *one-to-one* advising approach, where students were offered individual meetings with an advisor, and
- the *group advising* approach, where students were offered the opportunity to participate in an advising session along with some of their fellow Mohawk College students.

The PA initiative was implemented with a random assignment experimental design in mind, which—in sum—involves randomly separating targeted students into equally sized treatment and control groups. In this case, students were divided into three groups: those who were invited to participate in a one-on-one advising session (treatment 1), those who were invited to participate in a group advising session (treatment 2), and those who were not invited to participate in any kind of proactive advising session (control).

The findings suggest that proactive advising improved student retention at Mohawk College (Finnie et al., 2017). More specifically, the offer of proactive group advising improved overall first-term retention by 2.5 percentage points compared to the control group, but there was no statistically significant effect found for one-on-one advising.

Based on the pilot, it seems as though group advising, which was found to be most beneficial to student retention, may be the most promising and cost/time-effective way to support student success.

To further build evidence on the validity of the results of the pilot, and explore whether the results are generalizable across different colleges in Ontario, the logical next step for this line of research is to replicate the experiment at different sites.

2.2 Replication Study

Mohawk College has led and/or participated in various projects related to predictive modelling, advising interventions, goal setting, learning outcomes assessment, and data sharing projects to understand student success and even increased graduation rates from 60% to 65% since 2012. This expertise and willingness to innovate became the foundation for the development of the new College Student Success Innovation Centre (CSSIC) at Mohawk College in 2017: the very first research centre uniquely focused on community college student success located on a college campus in Canada.

CSSIC's goal is to foster a community of student success across the province through:

- innovation through continuous research and refinement of interventions that improve student outcomes;
- capacity building through an annual call for other colleges to replicate studies with the support of up to \$30,000 in matched funding, mentorship, project coordination, and data analytics; and
- knowledge sharing across the province through an annual symposium and continuous publication of results and toolkits.

The CSSIC fosters a community of student success innovation across the province through continuous research and refinement of interventions that Mohawk College has previously demonstrated to improve student retention. Guided by an advisory committee, the CSSIC has an annual competitive call for partner colleges to replicate studies.

The first call for partners searched for Ontario colleges to replicate Mohawk College’s pilot proactive advising study. Out of a number of colleges who were interested and applied to the call for partners, CSSIC’s advisory committee selected three college partners to participate in the proactive advising replication study:

- Centennial College,
- Fleming College, and
- Humber College.

The partner colleges were selected as they have all proven a dedication to investigating innovative ways to support their student body and ensure their success, and all possessed the advising resources, executive support, and technical data knowledge to replicate the proactive advising pilot study.

The experiments were conducted during the summer of 2019.

| |
|--|
| <p>Centennial College centennialcollege.ca Location: Toronto (GTA) Size: 22,000 full-time students # of campuses: 5</p> <p>Fleming College flemingcollege.ca Location: Peterborough Size: 4,500 full-time students (all campuses) # of campuses: 4 (3 with FT programs)</p> <p>Humber College humber.ca Location: Toronto Area (Etobicoke) Size: 33,000 full-time students # of campuses: 2</p> <p>Mohawk College (for reference) mohawkcollege.ca Location: Hamilton Size: 30,000 full-time students # of campuses: 3</p> |
|--|

3. Methodology

3.1 Experimental Design and Implementation of PA

In order to evaluate the effects of proactive advising on one-term student retention, this replication study targets incoming first-year students at Centennial, Fleming, and Humber College during the fall of 2019. To make the samples across participating colleges as comparable as possible, the following targeting criteria were applied:

- full-time students;
- domestic students;
- enrolled in certificate, diploma, or advanced diploma programs;³
- entering one of the designated campuses;
 - o Centennial: Ashtonbee, Downsview, Morningside, and Progress Campuses, as well as the Story Arts Centre,
 - o Fleming: Sutherland Campus,
 - o Humber: North and Lakeshore Campuses.

As students accepted their offers from participating colleges, and fit the targeting criteria of the experiment, three types of communication were planned following typical randomized controlled trial guidelines. Incoming students were randomly placed into one of three equally sized groups:

- 1) those who received an email inviting them to a one-to-one advising meeting (treatment group 1),
- 2) those who received an email inviting them to a small group advising session (treatment group 2), or

³ These programs typically vary in length from one to three years, respectively.

- 3) those who received an email with information about advising services (control group).

Before the fall term started, students in the control and treatment groups were contacted with a welcome message that was sent via email. As students accepted their offers of admission from the college at different points during the summer, the emails were sent out in one to four waves throughout the months of July and August 2019 (see Table 1).

Table 1: Waves of Communication between Participating Colleges and Target Groups

| Centennial College | Fleming College | Humber College |
|---------------------------------|---------------------------------|---------------------------------|
| Wave 1 (July 9) 3,419 students | Wave 1 (July 23) 1,746 students | Wave 1 (July 15) 4,800 students |
| Wave 2 (July 15) 1,527 students | | Wave 2 (July 22) 86 students |
| | | Wave 3 (July 29) 50 students |
| | | Wave 4 (August 6) 88 students |

For the control group, the message provided a general welcome to the college, informed students of the college’s advising resources available and encouraged them to meet with an advisor after the start of classes (see Appendix A). Students in the control group were not made aware of any of the group or one-to-one advising services offered to the treatment groups and there was no follow-up communication after the initial email. This was the passive (regular) outreach approach. One third of students from each college sample were assigned to the control group.

In contrast, the outreach to the treatment groups was more proactive and sustained. The treatment groups received a similar email to the control group, however, they were ‘strongly encouraged’ to participate in an advising session, and were offered an opportunity to book an appointment with an advisor for a one-to-one advising meeting or to participate in a group advising session before classes started (see Appendix A). One third of students from each college sample were assigned to each treatment group.

Students in the treatment groups who had not booked a one-to-one or group advising appointment within approximately two weeks from receiving the invitation email were sent email reminders, and follow-up phone calls from a combination of the colleges’ call centres, advising staff, and student leaders.^{4,5} Communication to these treatment groups included personalized messaging that directed them to their school websites for more information about advising resources as well as direct access to the school’s online scheduling system. We refer to these two treatment groups as the “one-to-one advising group” and “group advising group.”

The proactive advising process for this replication study (including welcoming students, explaining the consent process, the advising session, and the outgoing survey) were coordinated by professional advisors, student leaders, and support staff, and facilitated in predetermined locations on campus.⁶ When students checked in for their advising sessions,

⁴ Centennial made 246 calls, Fleming made 1,094 calls, and Humber made 1,982 calls. Centennial made fewer calls than the other partner colleges as they reached capacity 3 weeks before the end of the study. However, advising take-up at Centennial is on par and even surpasses the other two colleges.

⁵ Due to capacity limit, some students from Humber College who were assigned to the one-to-one advising group and did not book a session did not receive a follow-up phone call.

⁶ The advising sessions for Centennial students were held at Ashtonbee campus, Morningside campus, and Progress campus only.

the support staff or student leaders provided an introduction to the research project and went through the informed consent letter with them.⁷ Students also received a package of advising materials including the session agenda, a “top 10 tips for student success,” a checklist of items to complete before the first day of classes, and additional relevant admissions information they had already received from the college. Once this process was completed, they were introduced to the advisor running the session.⁸

Similar to the original Mohawk College project, the initial agenda for both one-to-one and group advising was exactly the same and consisted of advisor and student introductions, the establishment of session goals (including eliciting questions from the student[s]), and a transactional review of the important pre-entrance information students received in their acceptance package. This session agenda ensured that students clearly understood the purpose of the advising session: to review and clarify the steps students needed to complete to be successful in their first semester at college. The advising approach (in both one-to-one and group sessions) was to ask the student(s) to share one important question they were hoping to have answered during the session. For the group sessions, this became the main agenda, and advisors noted anecdotally that answering these individual questions took up most of the time. This process also coincidentally addressed many of the elements they planned on addressing in the resource documents. In one-to-one sessions, the process started off the conversations and helped transition the conversation to the resource documents. A copy of the agendas for both one-to-one and group advising sessions are included in Appendix B.

3.2 Data and Variable Definitions

Sample Exclusions

Based on the targeting criteria, some students had to be removed from the sample. First, 17 students from Fleming and 34 students from Humber College are excluded from the analysis sample because they changed their status from full-time to part-time. We also dropped two students who were taking dual-credit courses at Humber College⁹, and another two Humber students who had previous post-secondary experience. The behaviour of students who study part-time, take dual-credit courses, or have previous post-secondary experience than incoming full-time PSE students may vary, and the objective is to make the samples across all participating colleges as similar as possible.

In addition, we excluded students who received advising services that they were not originally assigned to from the analysis sample, i.e., those who were randomly assigned to the group advising treatment group, but participated in a one-to-one advising session, and vice versa (2 Fleming and 38 Humber students). Another two students from Humber College were removed from the sample because a support person went in with them during the advising session. Finally, there are 3,238 Centennial students, 1,431 Fleming students, and 4,363 Humber students in the analysis sample. Table 2 presents the number of students in

⁷ Students who did not consent could still participate in the advising sessions, but they were excluded from the study. Overall, 24 students from Centennial, 29 student from Fleming, and 86 students from Humber did not consent.

⁸ It should be noted that specially trained front-desk staff and student leaders, supervised by the research team, facilitated the welcome and informed-consent process, and not the advisors.

⁹ Taking a dual credit course at Humber College means that students have the opportunity to earn both a college course credit and a credit towards their secondary school diplomas.

each assignment group by college after these exclusions are imposed and, as mentioned above, each group approximately accounts for one third of each college sample.

Table 2: Control and Treatment Group Assignment

| | Control | Group Advising | One-to-one Advising | All |
|------------|---------|----------------|---------------------|-------|
| Centennial | 1,065 | 1,059 | 1,114 | 3,238 |
| Fleming | 483 | 471 | 477 | 1,431 |
| Humber | 1,455 | 1,486 | 1,422 | 4,363 |
| All | 3,003 | 3,016 | 3,013 | 9,032 |

Student and Program Variables

The variables used in this analysis include incoming student characteristics, such as gender, age, and high school grade point average, and program variables, such as field of study and credential.

The *gender variable* includes male and female, as well as a “missing” category for those whose gender information is not available or purposefully not shared with the institution, the latter representing only a small proportion of students.

The *age variable* is broken down into five categories: 18 and below, 19, 20 to 22, 23 to 26, and 27 and up.

In this study, this *high school grade point average variable*¹⁰ is calculated out of 100 based mainly on Grade 11 and 12 grades,¹¹ and then converted into a six category ordinal variable: A (80-100), B (70-79.9), C (60-69.9), D (50-59.9), F (below 50), and missing.

The *field of study variable* is constructed to have a consistent grouping of instructional programs across the three participating colleges. Student programs are grouped into six fields of study: Applied Sciences and Technology, Business and Hospitality, Health Sciences and Wellness, General Arts and Sciences, Media, Arts and Design, and Justice and Community Services.¹²

Finally, the *credential variable* simply captures the three types of credentials included in the study: certificate, diploma, and advanced diploma.

Assignment Group and Advising Participation Indicators

The *assignment group indicator* simply captures the assignment of students into the one-to-one advising group, the group advising group, or the control group as opposed to whether

¹⁰ Studies (Astin, 1997; Dooley et al., 2012) show that high school grade point average is a much better indicator of student retention than other factors.

¹¹ High school grade average is calculated slightly differently across participating colleges. At Centennial College, high school GPA is an adjusted score constructed by OCAS which is based on a number of factors that include courses and/or specific tests and test scores required for admission, equivalency tables, supplemental admissions criteria (i.e., interview/portfolio, survey etc.), course weighting, differentials (bonus points based on course level), and expiry dates (some courses/tests expire). At Fleming College, high school grade average is calculated based on Grade 11 and Grade 12 courses. At Humber College, high school grade average is calculated based on the 4 highest course marks (including the required subjects) for secondary school applicants and based on *mature student test* results for non-direct applicants without high school information.

¹² See Appendix C for an explanation of how programs of study correspond to field of study at each participating College.

they participated in an advising session. Remember, not all students in the treatment groups took up the advising services they were offered.

The *advising participation indicator*, however, captures whether a student took part in an advising session before the first day of classes of the fall 2019 semester. This variable does not capture the length of the session or the type of advising session students received. This means that both the treatment group and advising participation indicators need to be interacted in order to capture whether students took the one-to-one advising or group advising session.

The Outcome Variable

The outcome of interest in this study is one-term leaving. More specifically, the outcome variable captures whether students enrolled during the Fall 2019 semester come back for the Winter 2020 semester or not. The goal is to determine whether students assigned to the treatment groups are less likely to leave college than those in the control group.

Student and Program Characteristics by Control and Treatment Groups

The randomness in the assignment of students to the control and treatment groups reduces selection bias and allocation bias when evaluating the effectiveness of the intervention.

Specifically, in this randomized controlled trial, the hope is that student and program characteristics, including the ones that are potentially correlated with one-term leaving, are distributed equally across the control and treatment groups. This would remove the potential effects of differences in characteristics across assignment groups on one-term leaving when we simply compare the outcomes of the control and treatment groups. In other words, a successful random assignment would ensure that the mean difference in one-term leaving between the control and the two treatment groups would represent an unbiased estimate of the effect of the treatment.

Therefore, before assessing the effects of the proactive intervention on student retention, we first examine the distribution of students by student and program characteristics for each assignment group and participating college separately, and then test for differences across groups. To test for differences in the distribution of students by characteristics, we run simple linear regressions for each characteristic on the assignment group indicators and perform t-tests on their corresponding coefficients.

Table 3 presents the distribution of students by gender, age, high school GPA, field of study, credential, and wave for the control group and the relative differences in means for the treatment groups. Overall, the random assignment in this replication study appears to have been successful as, for each college, the distribution of student and program characteristics is very similar across the three assignment groups.

There are some exceptions, however, where the differences in means across assignment groups are statistically significant. But most of them are significant at the 10% level and the magnitudes of the differences are not very large. For example, at Fleming College, the fraction of male students in the one-to-one advising group is 6.2 percentage points higher than in the control group, which is statistically significant at the 10% level. These differences between the control and treatment groups will be taken into account by including all the explanatory variables in the models for estimating the effects of proactive

advising. Both the estimates of the treatment effects from models that include explanatory variables and those that do not are presented in this report.

Table 3: Comparison of Distributions of Control and Treatment Groups

| | | Centennial | | | Fleming | | | Humber | | |
|-----------------------|------------------------------|-------------------|---|---------------------|-------------------|---|---------------------|-------------------|---|---------------------|
| | | Control Group (%) | Difference in means compared to the control group | | Control Group (%) | Difference in means compared to the control group | | Control Group (%) | Difference in means compared to the control group | |
| | | | Group Advising | One-to-one Advising | | Group Advising | One-to-one Advising | | Group Advising | One-to-one Advising |
| Gender | | | | | | | | | | |
| | Male | 54.7 | 1.8 (2.2) | 0.5 (2.1) | 42.7 | 4.7 (3.2) | 6.2* (3.2) | 47.1 | -1.6 (1.8) | 1.2 (1.9) |
| | Female | 44.8 | -1.6 (2.2) | -0.3 (2.1) | 57.3 | -5.1 (3.2) | -6.8** (3.2) | 52.2 | 1.8 (1.8) | -0.8 (1.9) |
| | unknown | 0.5 | -0.2 (0.3) | -0.2 (0.3) | 0.0 | 0.4 (0.3) | 0.6* (0.4) | 0.6 | -0.2 (0.3) | -0.4* (0.2) |
| Age | | | | | | | | | | |
| | 18 and below | 28.5 | 1.4 (2.0) | 1 (1.9) | 36.2 | 3 (3.1) | 1.7 (3.1) | 35.6 | -0.5 (1.8) | -0.2 (1.8) |
| | 19 | 17.4 | -0.1 (1.6) | -2.7* (1.6) | 23.4 | -1.1 (2.7) | -1.2 (2.7) | 20.1 | 1.1 (1.5) | -0.2 (1.5) |
| | 20-22 | 23.3 | -0.6 (1.8) | 0.1 (1.8) | 20.9 | -1 (2.6) | 1.9 (2.7) | 21.8 | 0.6 (1.5) | 1.8 (1.6) |
| | 23-26 | 13.2 | -0.4 (1.5) | -1 (1.4) | 9.7 | -0.4 (1.9) | -2 (1.8) | 12.0 | 0.7 (1.2) | -1.0 (1.2) |
| | 27 and above | 17.6 | -0.3 (1.6) | 2.7 (1.7) | 9.7 | -0.6 (1.9) | -0.5 (1.9) | 10.5 | -1.8* (1.1) | -0.5 (1.1) |
| HS GPA | | | | | | | | | | |
| | A (80-100) | 51.9 | 1.7 (2.2) | 0.5 (2.1) | 23.8 | -5.6** (2.6) | -1.6 (2.7) | 33.1 | 0.6 (1.7) | 1.0 (1.8) |
| | B (70-79.9) | 28.4 | -2.9 (1.9) | -0.4 (1.9) | 40.0 | 4 (3.2) | 2.8 (3.2) | 44.6 | -0.3 (1.8) | -1.4 (1.9) |
| | C (60-69.9) | 8.0 | 1.2 (1.2) | 1.4 (1.2) | 30.8 | 0.6 (3.0) | -0.7 (3.0) | 19.5 | -0.5 (1.5) | 0.2 (1.5) |
| | D (50-59.9) | 1.9 | 0.1 (0.6) | -0.3 (0.6) | 1.9 | 1.1 (1.0) | 1.1 (1.0) | 2.3 | 0.3 (0.6) | 0.1 (0.6) |
| | F (below 50) | 4.2 | 0.2 (0.9) | -1.4* (0.8) | | | | | | |
| | missing | 5.6 | -0.3 (1.0) | 0.2 (1.0) | 3.5 | -0.1 (1.2) | -1.6 (1.0) | 0.5 | -0.1 (0.3) | -0.1 (0.3) |
| Field of Study | | | | | | | | | | |
| | Applied Sci. & Technology | 39.5 | 0.6 (2.1) | 1.9 (2.1) | 21.7 | 3.3 (2.7) | 4 (2.7) | 14.8 | 3.9*** (1.4) | 0.6 (1.3) |
| | Business & Hospitality | 8.9 | -0.2 (1.2) | 0.6 (1.2) | 9.5 | 2.2 (2.0) | 2 (2.0) | 19.4 | -1.1 (1.4) | 1.6 (1.5) |
| | Health Sciences & Wellness | 16.4 | 0.3 (1.6) | 1.3 (1.6) | 22.8 | -4.3 (2.6) | -1 (2.7) | 15.8 | -1.4 (1.3) | -1.0 (1.3) |
| | General Arts & Science | 3.8 | 0.7 (0.9) | 0.7 (0.9) | 10.1 | -2.5 (1.8) | -2.6 (1.8) | 7.1 | -0.5 (0.9) | -0.8 (0.9) |
| | Media, Arts & Design | 9.5 | -0.4 (1.3) | -1.3 (1.2) | 2.3 | -0.4 (0.9) | -0.8 (0.9) | 17.0 | -2.3* (1.3) | -2.4* (1.4) |
| | Justice & Community Services | 21.8 | -0.9 (1.8) | -3.3* (1.7) | 33.5 | 1.7 (3.1) | -1.7 (3.0) | 25.8 | 1.5 (1.6) | 2.0 (1.7) |
| Credential | | | | | | | | | | |
| | Certificate | 15.6 | 0 (1.6) | 0.7 (1.6) | 22.6 | -2.0 (2.7) | 2.6 (2.8) | 18.8 | 0.7 (1.5) | -1.8 (1.4) |
| | Diploma | 62.1 | -1.2 (2.1) | 1.1 (2.1) | 60.7 | 3.9 (3.1) | 2.2 (3.1) | 81.0 | -0.6 (1.5) | 1.8 (1.4) |
| | Advanced Diploma | 22.3 | 1.2 (1.8) | -1.8 (1.8) | 16.8 | -1.9 (2.4) | -4.8** (2.3) | 0.2 | -0.1 (0.2) | 0.0 (0.2) |
| Wave | | | | | | | | | | |
| | 1 | 76.6 | -1.2 (1.9) | -1.4 (1.8) | | | | 95.1 | 0.6 (0.8) | 0.5 (0.8) |

| | Control Group (%) | Centennial | | Fleming | | Humber | | |
|---|-------------------|---|---------------------|---|---------------------|---|---------------------|---------------|
| | | Difference in means compared to the control group | | Difference in means compared to the control group | | Difference in means compared to the control group | | |
| | | Group Advising | One-to-one Advising | Group Advising | One-to-one Advising | Group Advising | One-to-one Advising | |
| 2 | 23.4 | 1.2 (1.9) | 1.4 (1.8) | | | 2.1 | -0.5 (0.5) | -0.6 (0.5) |
| 3 | | | | | | 1.0 | 0.1 (0.4) | -0.2 (0.3) |
| 4 | | | | | | 1.9 | -0.2 (0.5) | 0.3 (0.5) |

Note: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

3.3 Analytical Approach

As discussed in the previous section, random assignment removes selection bias, and thus ensures that a simple comparison of student outcomes between the control and treatment groups yields an unbiased estimate of treatment effects. However, the proactive advising initiative also has a treatment non-compliance issue. This means that not all the students who are randomly assigned to one of the treatment groups took up the advising session, and, therefore, a simple comparison of outcomes between the control and treatment groups only captures the effect of being assigned to a treatment group and not the effect of the treatment. This measure is referred to as the intention-to-treatment (ITT) in the literature on program evaluation and ITT effects of proactive advising is the first measure presented in the report.

Considering students who did not take up the advising session cannot benefit from the treatment, ITT effects estimates likely understate the impact of the treatment on students who took up the advising session (Bloom, 1984). Nevertheless, a simple comparison of the mean outcomes of students in the treatment groups who also took up the treatment (the “treated”) and students in the control group would also not produce reliable estimates of treatment effects because those who partook in the treatment are not randomly chosen but instead self-select to take up the treatment. In other words, those who took up the treatment might differ from those in the control group in ways that also affect the outcomes. To explore the exact magnitude of the impact of the proactive intervention on advising participants, we follow Finnie et al. (2017) and employ an instrumental variable approach to recover an unbiased measure of the average treatment effect on the treated (ATET).

In randomized controlled trials where treatment non-compliance is a factor, a natural instrumental variable emerges in the status of random assignment (Bloom, 1984).¹³ In this study, a two-stage Least Square (2SLS) regression analysis where the instruments are the random assignment into group advising or one-to-one advising will provide an estimate for the ATET.¹⁴ As presented in Finnie et al. (2017), ATET is equal to the ITT effect divided by the compliance rate for those who were randomly assigned to the treatment groups. We will report the 2SLS estimates of the ATET following the estimates of the ITT effects.

¹³ An instrumental variable should be correlated with the decision to take up the advising but should not directly affect the outcome of interest (i.e., leaving during the first term) given the decision to take up advising. In other words, the instrumental variable should affect the outcome only through its relation to the decision to take up advising (see Angrist and Pischke, 2008).

¹⁴ The control group should not be exposed to any treatment. For more detail, see Bloom (1984) and Angrist and Pischke (2008)

In sum, while ATET estimates represent a measure of how successful the proactive intervention is for those who are sufficiently interested and motivated to take up the treatment, ITT effects represent a measure of the effects of a program that offers treatment, but does not require mandatory participation, on retention. From a policy perspective, calculating ITT effects is the more indicative measure should the proactive advising initiative be implemented college-wide considering treatment receipt can rarely be mandated (Bloom, 2006).

4. Findings

4.1 Intention-to-treatment (ITT) Effects of the Proactive Advising Interventions

Table 4 shows the estimates of the ITT effects of the offer of group and one-to-one advising services on leaving within one term. The treatment assignment effects are estimated for each college, and then for the full sample covering all three colleges.

Given that each college has a different number of students included in the study, the estimates of the ITT effects based on the initial unweighted three-college sample could be overpowered by the outcome of the college that accounts for the largest share of the sample. The weights are then adjusted so that each college has the same power to contribute to the aggregate result. Following the results based on the unweighted three-college sample, the calculation with adjusted weights is presented in Table 4 as well.

For all samples, the treatment assignment effects are estimated for the full sample, and then for male and female students separately. The first row of each set of results in Table 4 refers to the one-term leaving for the control group. The rows of the "Group Advising Difference" and "One-to-One Advising Difference" reports the estimated differences in mean one-term leaving for those offered group or one-to-one advising services compared to the control group.

Both the results from the linear regressions of one-term leaving on the assignment group indicator only (in the "No Controls" column) and results from regressions that control for all student and program characteristics variables (in the "All Controls" column) are presented for each sample. As shown in Table 4, in general, the estimates of the treatment assignment effects from the "No Controls" models and the "All Controls" models are very similar. This implies that the random assignment of students across control and treatment groups in this replication study is successful.

To use a simplified format, Figure 1 illustrates the probability of one-term leaving at each college and for the full weighted and unweighted samples. These numbers are calculated based on the coefficients of the "No Controls" regressions taken from Table 4, which is comparable to a simple comparison of one-term leaving rates across the assignment groups.

Across all samples in Figure 1, male students are more likely to leave within one term compared to female students. There is, however, one exception in the control group of Fleming College, where the probability of one-term leaving is slightly higher for female than for male students.

For Centennial College, neither those assigned to group advising nor one-to-one advising have a lower probability to leave within one term compared to the control group. Students in the control group have a 10.3% chance of leaving in the first term, while the

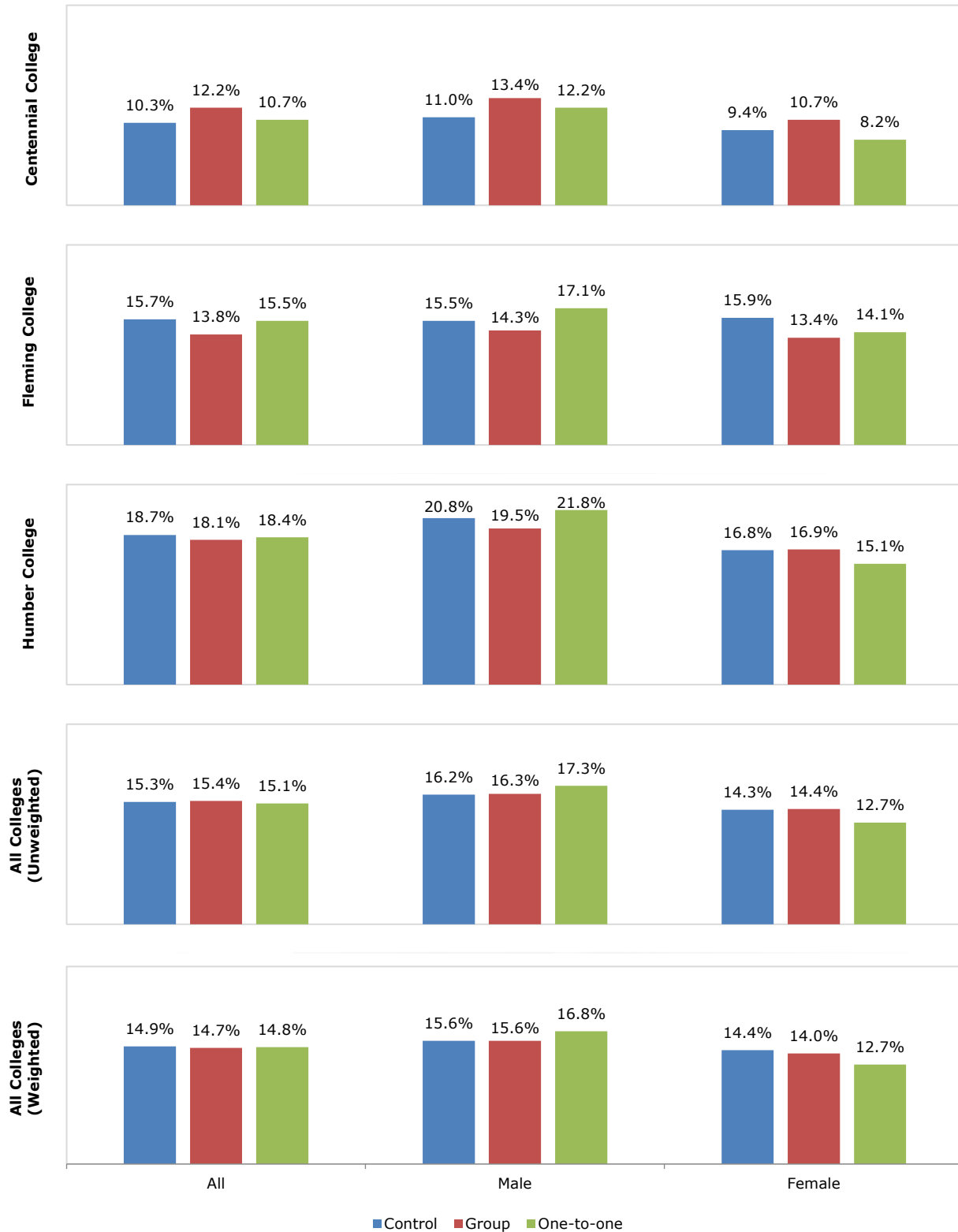
corresponding probability for group and one-to-one advising are 12.2% and 10.7%, respectively. The analysis by gender shows similar trends. Although the probability of one-term leaving for female students who are assigned to one-to-one advising group is around 1.2 percentage points lower than those in the control group, the estimated difference is not statistically significant at the 10% level. These results hold when all individual and program characteristics are taken into account (i.e. in the “All Controls” model). In all other groups, students in the treatment groups have higher probabilities of leaving than the control groups, but again none of the ITT effects are statistically significant.

At Fleming College, being assigned to group advising slightly reduces first-term leaving both at the overall level and by gender. For the full sample, those who are offered group advising services have a relatively lower probability of leaving within one term than the control group (13.8% compared to 15.7%). The results by gender show that the group advising assignment affects female students’ one-term leaving to a larger degree than their male counterparts: the probability of leaving for female students decreases from 15.9% to 13.4%, whereas male students’ probability decreases from 15.5% to 14.3%. However, the regression analysis indicates that none of these treatment assignment effects are statistically significant.

The one-to-one delivery model slightly lowers the probability of one-term leaving at Fleming College overall and for female students, but not for male students. For the full sample, a comparison across assignment groups shows that the probability of one-term leaving for those assigned to the one-to-one advising treatment group is 0.2 percentage points lower than those in the control group (15.5% compared to 15.7%). The corresponding difference for female students is 1.8 percentage points (14.1% and 15.9%). Again, none of these ITT effects are statistically significant. Compared to the group advising treatment assignment effect, the magnitude of the one-to-one advising treatment assignment effect is relatively smaller.¹⁵

¹⁵ However, the tests for equality of ITT effects suggest that the effects on leaving of being assigned to group and one-to-one advising are statistically the same for the full sample and by gender.

Figure 1: One-term Leaving by Assignment Group Overall and by Gender, All Samples



For the full sample at Humber College, we find that students in each treatment group have a relatively lower probability of leaving in the first term compared to the control group (group: 18.1%, one-to-one:18.4%, control: 18.7%). The effects, however, are very small and are not statistically significant either in the model with and without controls (Table 4). The results by gender show that the group advising ITT effects observed for the full sample (0.6%) were driven by male students who have a lower probability of leaving relative to the control group (group: 19.5%, control: 20.8%), while the one-to-one effects observed for the full sample (0.3%) are driven by female students (15.1% for one-to-one advising compared to 16.8% for the control group). Again, the regression analysis indicates that effects are not statistically significant.

In this study, we also estimate the aggregate effects of proactive advising on one-term leaving using the whole sample across all three colleges. For the unweighted sample, we do not observe a lower probability of one-term leaving for those who are offered group advising services relative to the control group, either at the overall level or by gender. Although those who are assigned to the treatment group of one-to-one advising have a lower probability of leaving relative to the control group for the full sample and for female students, these ITT effects are not statistically significant.

For the weighted sample, the assignment to either treatment group does not improve student retention for male students. Female students in the treatment groups have, however, a lower probability of leaving than the control group (group: 14.0%, one-to-one: 12.7%, control: 14.4%), but these ITT effects are not statistically significant. Thus, overall, neither of these treatment assignments lower students’ probability of leaving.

In summary, while most of the effects are of the expected sign (i.e., assignment to the treatment groups reduces leaving), there is no evidence allowing us to confirm with any statistical certainty that group advising or one-to-one advising improve student retention overall or at any particular participating college.

Table 4: Intention-to-Treat (ITT) Effects on One-Term Leaving (LPM)

| | Full Sample | | Male | | Female | |
|---|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| | No Controls | All Controls | No Controls | All Controls | No Controls | All Controls |
| Centennial College | | | | | | |
| Control Group Mean | 0.103 | | 0.110 | | 0.094 | |
| Group Advising Difference | 0.019 (0.014) | 0.020 (0.013) | 0.024 (0.019) | 0.023 (0.019) | 0.013 (0.019) | 0.014 (0.019) |
| One-to-One Advising Difference | 0.004 (0.014) | 0.006 (0.013) | 0.012 (0.019) | 0.017 (0.019) | -0.012 (0.019) | -0.011 (0.019) |
| Test for Equality of Group and One-to-One Effects (p-value) | 0.237 | 0.305 | 0.537 | 0.754 | 0.196 | 0.201 |
| # of Observations | 3,238 | | 1,797 | | 1,430 | |
| Fleming College | | | | | | |
| Control Group Mean | 0.157 | | 0.155 | | 0.159 | |
| Group Advising Difference | -0.019 (0.023) | -0.020 (0.023) | -0.012 (0.035) | -0.009 (0.034) | -0.025 (0.031) | -0.026 (0.031) |
| One-to-One Advising Difference | -0.002 (0.023) | -0.008 (0.023) | 0.016 (0.035) | 0.017 (0.034) | -0.018 (0.031) | -0.021 (0.031) |

| | Full Sample | | Male | | Female | |
|---|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| | No Controls | All Controls | No Controls | All Controls | No Controls | All Controls |
| Test for Equality of Group and One-to-One Effects (p-value) | 0.461 | 0.597 | 0.410 | 0.436 | 0.829 | 0.881 |
| # of Observations | 1,431 | | 662 | | 764 | |
| Humber College | | | | | | |
| Control Group Mean | 0.187 | | 0.208 | | 0.168 | |
| Group Advising Difference | -0.006 (0.014) | -0.006 (0.014) | -0.013 (0.022) | -0.008 (0.022) | 0.001 (0.019) | -0.002 (0.018) |
| One-to-One Advising Difference | -0.003 (0.014) | -0.006 (0.014) | 0.010 (0.022) | 0.006 (0.021) | -0.017 (0.019) | -0.018 (0.019) |
| Test for Equality of Group and One-to-One Effects (p-value) | 0.823 | 0.971 | 0.288 | 0.521 | 0.349 | 0.392 |
| # of Observations | 4,363 | | 2,050 | | 2,295 | |
| All Colleges (unweighted) | | | | | | |
| Control Group Mean | 0.153 | | 0.162 | | 0.143 | |
| Group Advising Difference | 0.001 (0.009) | 0.000 (0.009) | 0.001 (0.014) | 0.002 (0.013) | 0.001 (0.013) | -0.001 (0.012) |
| One-to-One Advising Difference | -0.002 (0.009) | -0.001 (0.009) | 0.011 (0.014) | 0.014 (0.013) | -0.017 (0.013) | -0.016 (0.013) |
| Test for Equality of Group and One-to-One Effects (p-value) | 0.760 | 0.919 | 0.465 | 0.392 | 0.152 | 0.234 |
| # of Observations | 9,032 | | 4,509 | | 4,489 | |
| All Colleges (weighted) | | | | | | |
| Control Group Mean | 0.149 | | 0.156 | | 0.144 | |
| Group Advising Difference | -0.002 (0.010) | -0.002 (0.010) | 0.000 (0.014) | 0.001 (0.014) | -0.004 (0.014) | -0.005 (0.014) |
| One-to-One Advising Difference | -0.001 (0.010) | -0.001 (0.010) | 0.012 (0.015) | 0.015 (0.014) | -0.017 (0.014) | -0.017 (0.014) |
| Test for Equality of Group and One-to-One Effects (p-value) | 0.974 | 0.874 | 0.426 | 0.314 | 0.346 | 0.404 |
| # of Observations | 9,032 | | 4,509 | | 4,489 | |

Note: Standard errors are indicated in parentheses under the estimates. None of the coefficients are statistically significant at the 10% level.

4.2 Average Treatment Effects of Group and One-to-one Advising on the Treated (ATET)

As described in section 3.3, ITT estimates capture the effects of being assigned to a treatment group while ATET estimates measure the effects of the treatment itself. By definition, ATET is equal to the ITT effect divided by the compliance rate for those who are randomly assigned to the treatment groups. In this project, since not all students who were randomly assigned to one of the treatment groups took up the advising sessions, the size of ATET should be larger than that of the ITT effects, and a lower take-up rate would result in an even larger ATET.

Table 5: Proactive Advising Take-up Rate (%)

| | Control | Group Advising | | | One-to-one Advising | | |
|------------|---------|----------------|------|--------|---------------------|------|--------|
| | | All | Male | Female | All | Male | Female |
| Centennial | 0 | 13.6 | 11.9 | 16.0 | 21.5 | 18.7 | 25.2 |
| Fleming | 0 | 8.9 | 8.1 | 9.8 | 11.7 | 9.9 | 12.9 |
| Humber | 0 | 12.8 | 9.9 | 15.2 | 13.4 | 10.8 | 15.8 |

Table 5 reports proactive advising take-up rates for each treatment group at each college, again, for the full sample and by gender. Students assigned to the one-to-one advising group have higher take up rates than those assigned to group advising, and advising take-up rates are lower for male than for female students.

Table 6 shows the estimates of the average effects of proactive advising on those who are randomly assigned to the treatment groups and also take up the advising services. Given that the compliance rates in this replication study are low (around 10% to 20%), the estimated treatment effects are much larger than the ITT effects, as expected.

The two-stage least square estimates of ATET imply that, at Centennial College, the only group of students seemingly benefiting from the initiative is female one-to-one advising participants as their probability of leaving is 4.6 percentage points lower than what their probability of leaving would have been if they had not participated in these advising sessions.¹⁶ However, this treatment effect is not statistically significant.

For Fleming College, ATET estimates suggest that the probabilities of leaving are 21.7 and 1.9 percentage points lower for group and one-to-one advising participants than they would have otherwise been should they have not participated in those advising sessions. Similar results are found for female students: the group advising and one-to-one advising reduce their chances of leaving within one term by 25.3 and 13.8 percentage points, respectively. For male students, the treatment effects of group advising (12.0 percentage points lower) are relatively smaller compared to their female counterparts. Again, however, none of these treatment effects are statistically significant.

Humber College shows small and not statistically significant ATET for advising participants at the overall level (a reduction in leaving of 4.6 and 2.0 percentage points for group and one-to-one advising) and for female one-to-one advising participants (10.6 percentage points decrease in leaving). Male advising participants also see a reduction in their probability of leaving (13.6 percentage points), but only for group advising participants and these effects are also not statistically significant.

Even across all three colleges, we do not find any statistically significant ATET, either at the overall level or by gender. The regressions with and without adjusted sampling weights show similar results: the nonsignificant negative treatment effects of one-to-one advising (both weighted and unweighted estimates) and group advising (weighted estimates) are driven by female students.

To summarize, much like for ITT effects, we do not find any significant treatment effects of either advising methods on one-term leaving in this replication study.

¹⁶ As discussed in Finnie et al. (2017), the probability of leaving for the advising session participants should not be compared to those in the control group as these two groups are likely not similar in terms of their characteristics due to the participants' self-selection on the decision to take up the services.

Table 6: Two-Stage Least Squares (2SLS) Estimates of Average Treatment Effects on the Treated on Leaving (ATET)

| | Full Sample | | Male | | Female | |
|---|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| | No Controls | All Controls | No Controls | All Controls | No Controls | All Controls |
| Centennial College | | | | | | |
| Group Advising Difference | 0.143 (0.102) | 0.147 (0.101) | 0.201 (0.162) | 0.192 (0.160) | 0.081 (0.124) | 0.089 (0.123) |
| One-to-One Advising Difference | 0.016 (0.061) | 0.031 (0.061) | 0.065 (0.099) | 0.094 (0.102) | -0.046 (0.072) | -0.039 (0.072) |
| Test for Equality of Group and One-to-One Effects (p-value) | 0.161 | 0.189 | 0.349 | 0.490 | 0.189 | 0.221 |
| # of Observations | 3,238 | | 1,797 | | 1,430 | |
| Fleming College | | | | | | |
| Group Advising Difference | -0.217 (0.259) | -0.219 (0.248) | -0.147 (0.427) | -0.120 (0.418) | -0.253 (0.320) | -0.268 (0.322) |
| One-to-One Advising Difference | -0.019 (0.200) | -0.062 (0.196) | 0.165 (0.361) | 0.167 (0.336) | -0.138 (0.245) | -0.166 (0.250) |
| Test for Equality of Group and One-to-One Effects (p-value) | 0.395 | 0.493 | 0.424 | 0.460 | 0.694 | 0.727 |
| # of Observations | 1,431 | | 662 | | 764 | |
| Humber College | | | | | | |
| Group Advising Difference | -0.046 (0.112) | -0.043 (0.108) | -0.136 (0.219) | -0.077 (0.205) | 0.006 (0.125) | -0.016 (0.122) |
| One-to-One Advising Difference | -0.020 (0.108) | -0.045 (0.105) | 0.092 (0.206) | 0.059 (0.197) | -0.106 (0.120) | -0.116 (0.118) |
| Test for Equality of Group and One-to-One Effects (p-value) | 0.8114 | 0.985 | 0.284 | 0.517 | 0.353 | 0.400 |
| # of Observations | 4,363 | | 2,050 | | 2,295 | |
| All Colleges (Unweighted) | | | | | | |
| Group Advising Difference | 0.011 (0.074) | 0.003 (0.073) | 0.007 (0.130) | 0.019 (0.124) | 0.010 (0.088) | -0.006 (0.087) |
| One-to-One Advising Difference | -0.009 (0.057) | -0.003 (0.057) | 0.077 (0.099) | 0.099 (0.097) | -0.090 (0.067) | -0.086 (0.068) |
| Test for Equality of Group and One-to-One Effects (p-value) | 0.767 | 0.922 | 0.554 | 0.487 | 0.206 | 0.303 |
| # of Observations | 9,032 | | 4,509 | | 4,489 | |
| All Colleges (Weighted) | | | | | | |
| Group Advising Difference | -0.015 (0.086) | -0.024 (0.084) | 0.002 (0.145) | 0.003 (0.139) | -0.030 (0.105) | -0.039 (0.087) |
| One-to-One Advising Difference | -0.009 (0.065) | -0.008 (0.065) | 0.089 (0.110) | 0.112 (0.108) | -0.097 (0.080) | -0.095 (0.068) |
| Test for Equality of Group and One-to-One Effects (p-value) | 0.941 | 0.834 | 0.511 | 0.394 | 0.474 | 0.543 |
| # of Observations | 9,032 | | 4,509 | | 4,489 | |

Note: Standard errors are indicated in parentheses under the estimates. None of the coefficients are statistically significant at the 10% level.

5. Discussion and Conclusion

Discussion of the Findings

The pilot study conducted at Mohawk College found that being assigned to group advising has a positive intention-to-treat (ITT) effect on student retention overall. The effects, however, are not consistent for male and female students as assignment to group and one-to-one advising only improves retention for male students. Similar results are found for the average treatment effects on the treated (ATET).

In this replication study, which aimed to explore the generalizability of the results of the Mohawk pilot to other colleges in Ontario, we are unable to find any evidence that the proactive advising initiative has a positive effect on student retention overall or at any particular participating college. In fact, none of the estimates of ITT effect or ATET are statistically significant.

In a context where the proactive advising literature generally finds that proactive advising has positive effects on at least some outcomes for some students, why do we obtain the results we do? This section discusses some potential explanations as to why Mohawk College's findings did not generalize to the participating colleges.

To ensure uniformity as much as possible, Mohawk College provided partners with funding and ensured overall project coordination. The communication templates and the agenda of advising sessions developed by Mohawk for the pilot study were used in this replication study to make sure the initiative was consistent across sites and stayed true to the pilot. However, there could have been differences in the advising services provided or other aspects of the treatment that could have influenced the effectiveness of the interventions.

Another potential explanation could be that, in the pilot study, the causal effects of proactive advising are, at best, significant at the 5% level, based on relatively large sample sizes. The smaller sample sizes of some of the college partners would have made finding statistically significant results less likely.¹⁷

Comparing across sites, the probability of one-term leaving at Centennial College (10.3%) is quite low compared to the other colleges involved in the replication study (Fleming: 15.7%, Humber: 18.7%, and Mohawk: 16%). This is likely due to the larger share of Centennial students who are older and have prior PSE experience (among other factors), which are both factors typically related to lower leaving in the retention literature.¹⁸ The relatively lower leaving at Centennial College does not, therefore, leave much room for proactive advising to have an effect. Furthermore, the Mohawk pilot study found that that proactive advising seems to work best for students who are most likely to leave, which could further help explain why we do not find the positive treatment effects on one-term retention at Centennial.

Finally, while this study uses a randomized control trial design, random differences in the treatment and control groups may nevertheless exist in ways that are not captured in the data, which otherwise generally suggest that there were no important differences across the

¹⁷ The estimates of the treatment effects at Humber College are still not statistically significant even though the sample size of Humber is not much smaller than that of Mohawk College. At least for Humber College, the statistically non-significant estimates are likely not due to the sample size.

¹⁸ At Centennial, students who were 27 and older account for 17.6% of the sample, which is much higher than the ratio at Mohawk (8.8%).

groups at any of the sites. Some examples of unobserved characteristics could include being a first-generation PSE goer, coming from a single-parent family, or being from a lower socio-economic background, among others, some of which could be related to student success, and therefore affect the estimates found. However, there is no reason to suspect that any such differences would have worked in a consistent fashion and led to a general underestimation of the effects of the proactive advising.

All this said, there is no obvious explanation of why the results found at Mohawk did not generalize to the other institutions. Perhaps a best guess would be a combination of underlying differences in the quality/style of the proactive advising at Mohawk and the other colleges, the relatively smaller sample sizes, and some combinations of both observed and unobserved differences in the characteristics of students in the overall student populations in comparison to Mohawk and across treatment and control groups. But by definition, this remains a speculative exercise.

Conclusion and Future Research

Identifying the underlying factors associated with the effectiveness of proactive advising interventions might be crucial in examining the generalizability of the findings at Mohawk College and may prove to be the next research step. For instance, how did implementation challenges faced by advisors influence the quality of the advising services or for which group of students was proactive advising most successful? Understanding what factors and how these factors relate to student outcomes will definitely help researchers improve experimental design and will also help colleges improve the efficiency of advising service delivery.

While this replication study finds no evidence suggesting significant positive effects of proactive advising on student one-term retention, we do observe some small effects at some participating colleges. It is possible that the long-term effect of proactive interventions could be incremental or that their effect on student outcomes are not yet detectable or observable (e.g. college satisfaction or engagement). It is also possible that the positive and negative effects on different groups of students are averaged out the analysis. Generally, proactive advising is still a promising strategy to improve student outcomes based on the extensive literature: however, further research is needed to evaluate the effectiveness of proactive advising specifically in an Ontario college context.

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8. Appendix

8.1 Appendix A – Control and Treatment Groups’ Communication

Hello (Student Name),

We are excited for you to join us at (insert college name)!

An important part of your success as a student will be the relationships you build with your faculty and your (hyperlink to student success advisor description from college webpage). They can help you in many ways during your time at the College. We believe the earlier you start that process, the better!

(Insert the following statements according to each group)

(Control group) We would like to encourage you to meet with an advisor in your first semester. We can help you navigate our systems, ensure you are ready before the first day of class, and answer any questions you may have.

(1:1 session) We would like to strongly encourage you to book a one-to-one advising session before classes start. We can help you navigate our systems, ensure you are ready before the first day of class, and answer any questions you may have. To book a meeting simply call us at (insert phone number) or e-mail (insert email).

(Group session) We would like to strongly encourage you to book a group advising session before classes start. We can help you navigate our systems, ensure you are ready before the first day of class, and answer any questions you may have. To book a meeting simply call us at (insert phone number) or e-mail (insert email).

(for 1:1 AND group advising emails) Providing you with the opportunity to meet with a Student Success Advisor prior to starting classes is a new service that is part of a funded research project approved by the College’s Research Ethics Board. We hope you consider participating. Full details are available in the attached informed consent document. A member of our team will explain the details to you in person before you meet with your advisor.

‘Day One’ for the Fall semester is (insert date here). For more important dates, view the (insert college academic calendar link here). We also have many wonderful orientation events and activities planned. Full details are available here: (link to college orientation information). We wish you all the best, and look forward to seeing you soon.

Sincerely,

Your Student Success Team

Insert college name

Insert college address

Visit (insert as appropriate) if you would no longer like to receive emails from (insert college name).

8.2 Appendix B – One-to-One and Group Advising Session Agenda

Duration: 30-45 minutes

Possible Facilitators

SSAs and SSCs

Preparation + Materials

PowerPoint & Copies of Session Handouts
Informed Consent Letters + Envelopes/Folders
The Student Guides (Registration Guide)
Chart Paper + Markers OR Whiteboard Markers
Projector Key + Remote

Agenda Breakdown + Prompts:

Pre-Session Administration (to be determined at each individual college)

The assigned staff will introduce the research study and go through the Informed Consent letter. One copy will be signed and kept with research documents. A copy will be provided to the student.

Facilitator/Advisor introduction & Session Goals (5 mins) (each college will adjust for their context)

- Hometown, advising portfolio, something interesting about themselves.
- SSA Postcard and Webpage review
- Session goals
 - o Intro Advising Services (partially done already)
 - o Ensure you are prepared to start your program (the Student Guide, FNAP, Start Smart, AFS, Day One, MoCo, Blended Learning). Advisor to walk everyone in the group through these basic steps and answer questions.
 - o (group session) Meet another student (or many)

Participant/Student introduction (5 mins)

- Student to share name, program, hometown, and one question they hope to have answered today.
- SSA to write down the important questions (on own paper)
- SSA to ensure they are informed about who their full-time SSA is, and to ensure the student gets their question answered.

Review the College's Student Guide and Associated Resources (15mins) (each college will adjust for their context)

- Walk through each section and ensure students are aware of process and what they need to do: AFS, FNAP, OneCard, BookStore, Start Smart, Day One. Use computer/projector to demonstrate.
- Introduce Blended Learning and MoCoMotion

Conclusion (5mins) (each college will adjust for their context)

- Reminder: Importance of Goal Setting and Participation
- Referral to Start Smart to participate in 'Building your FutureReady Plan' session (provide info)
- Referral to full-time SSA and the LSC in September (provide info)
- Referral to Program Coordinator on Day One and in September (provide info)
- Review questions and ensure student has their primary question answered.

8.3 Appendix C – Field of Study Variables Mapped to Programs of Study

| 1. Applied Sciences and Technology | | |
|---|---|--|
| Centennial | Fleming | Humber |
| ATS Truck Coach MAP32 Aerospace Mfg. Eng Technician Aerospace Mfg. Eng Technology Airframe Assembly Architectural Technician Architectural Technology Architectural Technology FT Auto & Robotics Technician Auto & Robotics Technology Auto & Robotics Technology FT Auto Body Repair Technician Auto Body Repair Techniques Auto Parts & Service Operation Aviat Techy Avion Maint & Mgmt Aviat Techy-Aircft Maint & Mgt Aviation Techn. - Aircraft Aviation Techn. - Avionics Biomedical Engn. Techgy FT Biomedical Engineering Techgy Biotechnology Biotechnology Advanced Biotechnology Advanced FT Biotechnology FT Computer Repair & Maintenance Computer Sys Technician - Net Computer Sys Technology - Net Electrical Engineering Techn Electrical Engineering Techy Electronics Eng. Technician Electronics Eng. Technology Energy Syst. Engin. Technician Energy Syst. Engin. Technology Energy Systems Eng Techy FT Environmental Technician Environmental Technician FT Environmental Technology Environmental Technology FT Food Science Technology Food Science Technology FT Game - Programming General Motors ASEP - MAP Health Informatics Technology Heating,Refrig. & A/C Techn Honda/Acura MAP 32 MP-Heavy Duty Equip Technician MP-Truck & Coach Technician Mech Eng Technician - Design Mech Eng Technology - Design Mech Eng Technology - Ind. Mech Eng Techy - Design FT Mech Engin Techy- Ind FT Medical Laboratory Technician Motive Power Technician Motorcycle & Powersports Rep Software Eng Technician Software Eng Technician FT Software Eng Technology Technology Foundations - ICET Toyota - MAP | Carpentry and Renovation Technician Carpentry and Renovation Techniques Computer Engineering Technician Computer Engineering Technology Computer Security and Investigations Construction Engineering Technician Electrical Engineering Technician Electrical Techniques Heating, Refrigeration and Air Conditioning Instrumentation and Control Engineering Technician Mechanical Techniques - Plumbing Trade Fundamentals Welding and Fabrication Technician Welding Techniques | Building Construction Tech Carpentry & Renovation Tech Carpentry and Renovation Tech Computer & Network Sup Tech Computer Programmer Construction Engineering Techy Design Foundation Electrical Eng Techn-Cntrl Sys Electrical Techniques Electromech Eng Technician Electronics Engineering Techn Electronics Engineering Techy Heating, Refgn and A/C Techn Industrial Woodworking Techn Interior Decorating Landscape Technician Mechanical Engineering Techn Millwright Techniques Plumbing Techniques Urban Arboriculture Welding Techniques |

| | | |
|---|---|--|
| Trades Foundation-Motive Power Volvo Truck MAP 32 | | |
| 2. Business and Hospitality | | |
| Centennial | Fleming | Humber |
| Baking Skills Baking and Pastry Arts Mgmt Bookkeeping Bus. Admin. Leadership & Mgmt. Business Business - Accounting Business - Int'l Business Business - Marketing Business Admin - Accounting Business Admin - Marketing Business Admin-Human Resources Business Admin. - Finance Business Foundations Business-Supply Chn. & Oper. Culinary Management Culinary Skills Fashion Business & Management Financial Services Hospitality & Tourism Admin Hospitality Foundations Hospitality-Hotel Opns Mgmt International Business Office Admin - Executive Office Admin - Health Services Office Admin - Legal Office Administration-General Pre-Business Special Event Planning Supply Chain & Operate. Mgmt. Tourism-Travel Services Mgmt | Business Business - Accounting Business - Human Resources Business Administration Business Administration - Accounting Business Administration - Human Resources Management Business Administration - Marketing Culinary Management Culinary Skills Hospitality - Hotel and Restaurant Operations Office Administration - Executive Sporting Goods Business Tourism - Global Travel | Accounting Diploma Baking and Pastry Arts Mgmt Business - Marketing Business Administration Business Management Business Mgmt: Financial Svc Cosmetic Management Culinary Management Culinary Skills Esthetician: Spa Management Fashion Arts and Business Hospitality - Event Management Hospitality-Hotel&Rest Ops Mgt Tourism-Travel Services Mgmt |
| 3. Health Sciences and Wellness | | |
| Centennial | Fleming | Humber |
| Esthetician Fitness and Health Promotion Food Service Worker Health Studies & Comm. Skills Healthcare Environ. Serv. Mgmt Massage Therapy Nutrition & Food Service Mgmt. Occupat/Physiotherapist Asst Paramedic Personal Support Worker Pharmacy Technician Practical Nursing Practical Nursing - Flexible Practical Nursing - IEN FT | Biotechnology - Advanced Esthetician Fitness and Health Promotion Health Information Management Massage Therapy Occupational Therapist Assistant and Physiotherapist Assistant Paramedic Personal Support Worker (Peterborough) Pharmacy Technician Practical Nursing | Biotechnology Fitness and Health Promotion Food and Nutrition Management Funeral Director Class 1 (Emb) Funeral Director Class 2 (NE) Funeral Transfer Svc Sales Rep Nutrition and Health Promotion OTA and PTA Paramedic Personal Support Worker Pharmacy Technician Practical Nursing |
| 4. General Arts and Sciences | | |
| Centennial | Fleming | Humber |
| General Arts & Science - EAP General Arts and Science Liberal Arts Pre-Health Sciences Pathway | General Arts and Science - University Transfer Pre-Health Science Pathway to Advanced diplomas and degrees Pre-Health Science Pathway to Certificates and diplomas | G.A.S. College Transfer G.A.S. Technology G.A.S. University Transfer General Arts & Science Diploma Pre-Health Science Pathways |

| 5. Media, Arts and Design | | |
|---|---|---|
| Centennial | Fleming | Humber |
| Advert. & Market. Commun Mgmt. Animation - 3D Art & Design Fundamentals Broadcasting Communications and Media Fund. Dance Performance Digital Visual Effects Fine Arts Studio Game - Art Game - Development Graphic Design Journalism Music Industry Arts & Perform. Performing Arts Fundamentals Photography Theatre Arts & Performance | Graphic Design-Visual Communication | 3D Mdl and Visual Effect Prod Acting for Film and Television Advertising & Marketing Comm Advertising and Graphic Design Animation – 3D Art Foundation Broadcast TV & Videography Broadcasting - Radio Comedy Writing & Performance Film and TV Production Graphic Design Intro to Commercial Jazz - Gui Intro to Commercial Jazz - Key Intro to Commercial Jazz - PER Intro to Commercial Jazz - TRU Intro to Commercial Jazz - VOI Intro to Commercial Jazz - WDW Intro to Commercial/Jazz -Bass Journalism Media Communications Media Foundation Multimedia Design and Dev Photography Theatre Arts - Technical Prod Visual and Digital Arts |
| 6. Justice and Community Services | | |
| Centennial | Fleming | Humber |
| Addiction & Mental Health Wrkr Child and Youth Care Comm. & Child Stud. Foundation Community and Justice Services Community Development Work Court Support Services Developmental Services Worker Early Childhood Education Early Childhood Education PR Law Clerk Police Foundations Pre-Service Fire. Edu. & Train Recreation & Leisure Services Social Service Worker | Child and Youth Care Community and Justice Services Customs Border Services Developmental Services Worker Early Childhood Education (Peterborough) Educational Support Law Clerk Mental Health and Addiction Worker Paralegal Police Foundations Pre-Service Firefighter Education and Training Protection, Security and Investigation Recreation and Leisure Services Social Service Worker | Child and Youth Care Community and Justice Services Developmntl Srvs Wrkr Early Childhood Educ Emergency Telecommunications Fire Services Law Clerk Paralegal Education Police Foundations Protectn,Security&Investigatn Recreation & Leisure Services Social Service Worker |