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Cover Page Footnote

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Centering the Marginalized: The Impact of the Pandemic on Online Student Retention

By Joshua Travis Brown, University of Virginia; Joseph M. Kush, Johns Hopkins University; Fred Volk, Liberty University

During the pandemic, much of the focus of administrators and scholars has been on its impact on residential students and the sudden shift to online instruction. While justified, researchers have yet to focus on online students—who often represent marginalized communities in higher education—to ask whether they were impacted by factors related to the pandemic other than the modality shift. In this study, we examined how the first-year retention of online students was affected during the pandemic, and whether it differed from first-year residential students who transitioned online. We examined records of two student cohorts (Fall 2017 and Fall 2019) from a university to determine each cohort's retention rate by modality. Holding other relevant factors constant, we found the COVID cohort of students were less likely to persist to the following Fall regardless of modality, although residential students were still much more likely to be retained overall. However, Black and Hispanic students were less likely to be retained across both modalities, and even Black residential students were more vulnerable to not returning than their White counterparts, suggesting that racial inequalities persist across learning modalities. We conclude by suggesting how one retention tool—financial aid—could be used to address the particular needs of online students to improve their retention.

Keywords: *retention, financial aid, inequality, online education, enrollment management*

The COVID-19 pandemic transformed how many organizations delivered their services, including colleges and universities. Institutional leaders quickly altered their educational model in response to the pandemic, with most closing their residential campuses and shifting course delivery online (Marsicano et al., 2020). Education advocates cautioned that providing courses entirely online might negatively impact the retention of marginalized students making the transition, specifically minoritized students, those with food insecurities, international students, and low-income students unable to secure the necessary technological resources to participate (Aucejo et al., 2020; Goldrick-Rab, 2020; Harper, 2020). Few of these calls focused on how the onset of the pandemic might also impact the large population of predominantly unseen online students already studying in a digital modality. Online students have historically been more likely to be members of underrepresented student populations, caretakers, and full-time employees that constrain them from participating in residential courses and negatively influence their ability to effectively navigate academic demands (Morris et al., 2005). Despite the fact that online student enrollment has historically involved a greater proportion of marginalized students, attention was almost exclusively focused on retaining the more readily seen residential students (Morris et al., 2005; Shaw et al., 2016; Xu & Xu, 2020). Marginalized students previously studying online were therefore potentially faced with a double marginalization in comparison to their residential peers.

In recent years many institutions adopted a hybrid model of student enrollment comprised of both residential and online students, one that necessitated administrators reconsider traditional

approaches to student retention (Breneman, 2011; Christensen & Eyring, 2011; Crow & Dabars, 2020). Institutional leaders typically leveraged three important tools to improve college student retention: curriculum, services, and financial aid (Gross et al., 2015; Martin, 2015; Skoglund et al., 2018). Due to the timing of the onset of the COVID-19 pandemic, university leaders were unable to institute curriculum changes to address student needs, but quickly leveraged the other tools they had in an attempt to ensure the crisis did not differentially impact the persistence of marginalized students most at risk of dropout (Blankenberger & Williams, 2020). Although certain student services had an intrinsic "real-world" component (such as childcare, dining services, residential life and health services) that were unable to functionally transition to a digital medium, other critically important offerings for marginalized students (such as tutoring and counseling) were shifted to an online format (Carrasco, 2021a; Chierichetti, 2020). Financial aid approaches for these students similarly adapted to the shift online, grounded in new guidance from federal agencies that modified approvals for distance learning, a continuance of work-study resources, and refunds for discontinued enrollment and residential student services (Redden, 2020a). Yet these institutional responses to the pandemic were overwhelmingly focused on residential programs and services—despite the fact that enrollment at most institutions is made up of both residential and online students.

This study examines factors that confronted the overlooked online student population and asks: Did the COVID-19 pandemic impact the retention of first-year online students, and did the experiences of first-year residential students who transitioned online during the pandemic differ from those who were already online?

To examine this question and isolate the impact that the COVID-19 pandemic has had on first-year retention across educational modalities, we obtained registration records for two cohorts of first-year undergraduate students in the Fall of 2017 (n = 10,348) and the Fall of 2019 (n = 12,196). The degree programs offered to the cohorts in the residential and online modalities were nearly identical. We examined differences in first-year retention among online students, residential on-campus students, and residential off-campus students. While controlling for gender, socio-economic status, and first-semester retention, we found that the Fall 2019 COVID cohort was significantly less likely to return for the following Fall term, although those who managed to enroll in the 2020 Spring term (i.e., first-semester retention) were more likely to return in the following Fall. While residential students were more likely to return than online students, Black and Hispanic students in both modalities were less likely to return the following Fall than White students, and in particular Black *on-campus* students were more vulnerable to not returning the following Fall than their White counterparts.

The findings from this research underscore important insights for higher education. While environmental factors were negatively related to student retention in both residential and online modalities, racial inequalities persist across learning modalities, and online retention still lags its residential counterpart. We end the study with suggestions regarding how one retention tool—financial aid—could be used more equitably to address the unique needs of online modalities to improve student retention and success for this unseen student population.

Institutions with Diverse Educational Modalities

At the turn of the century, institutions began to incorporate an online model of learning as part of their educational approach, which previously had emphasized a residential model of learning (Brown, 2021; Siemens et al., 2015). During this time, the widespread adoption of

technology and the internet improved access to higher education for new student populations and established new models of student financial aid to support these students (Deming et al., 2015; Skinner, 2019). State legislatures substantially reduced higher education spending in the same era, forcing institutional leaders to cover budget shortfalls by raising tuition or increasing student enrollment (Barr & Turner, 2013; McClure et al., 2020). When many institutions established new online programs, the overall composition of their student enrollment substantively changed to a more diverse mix of learners distributed across educational modalities (Bettinger & Loeb, 2017; Ortagus, 2017).

Hybrid student enrollments comprised of both residential and online student populations have become a widespread enrollment model throughout higher education (Breneman, 2011). Many institutions grew the online portion of the university in ways that came to numerically rival the residential portion. How they reached these numbers varied: some universities like Penn State, Maryland, Washington State, Colorado State, and Illinois established online "global campuses" (Kolowich, 2009) while other schools established online partnerships with major corporations for workforce education, such as those between Arizona State and Starbucks or Florida and Walmart (Jaschik, 2014). Institutions like Ohio State, Southern New Hampshire, Liberty, Grand Canyon, Dallas College and Central Florida worked mightily to "organically" scale up their online enrollment, whereas others like Purdue, Arkansas, Massachusetts, and Arizona simply purchased an entirely online university that had already scaled up its enrollment (Cheslock & Jaquette, 2021; McKenzie, 2019; S. Smalley, 2021). Yet regardless of how they achieved their hybrid student enrollment, this shift to online education has required institutional leaders to reconsider traditional approaches to college student retention and financial aid (Christensen & Eyring, 2011; Crow & Dabars, 2020; Rine & Brown, 2022).

Retention Tools in Diverse Modalities: Curriculum, Services & Financial Aid

Pursuing a college degree is a significant financial investment for students, families and institutional leaders alike, all of whom possess an interest if an individual ultimately reaches graduation. Retention looks at the year-over-year enrollment of a student at a given school (Federal Student Aid Office, n.d.; Hirschy, 2015). Typical retention rates for institutions range from 60% at colleges with open admissions to over 95% for selective colleges that accept fewer than one-quarter of applicants (Hussar et al., 2020). Postsecondary retention is commonly conceptualized in three distinct phases of the collegiate experience: initial enrollment, first-year retention, and persistence to graduation (Voigt & Hundrieser, 2008). The largest spike in attrition (i.e., individuals who drop out) for both residential and online students occurs in the first year of attending college (Cochran et al., 2013; Hanson, 2021).

Institutional leaders customarily rely on three important tools to improve retention—specialized curriculum, student services, and financial aid. *Specialized curriculum* for residential students aims to engage students in a variety of ways, ranging from orientation classes for new students, experience courses related to specific majors, and supplemental instruction courses for those identified as academically at-risk (Black et al., 2016; Hizer et al., 2016; Wischusen et al., 2011). Curricular approaches also provide information to help students become acclimated with academic demands or foster skills such as time management and study habits likely to increase student success (Skoglund et al., 2018). Virtual curricular efforts predominantly focus on distributing information for academic success, self-directed learning, and developing student self-efficacy (Abdous, 2019; Raish & Behler, 2019; Tibingana-Ahimbisibwe et al., 2020).

University administrators have increasingly established virtual orientation options to bolster online student retention and success (Connolly, 2010; Jones, 2013; Mensch, 2017; Watts, 2019).

Administrators have commonly relied on *student services* as a second tool to fortify student retention through the first academic year. For residential students, many services, such as recreation, intramural sports, and social activities, aim to establish a sense of belonging with the university during the first year of attendance when dropout rates have historically been highest (Martin, 2015; Sanderson et al., 2018). Likewise, access to free tutoring and academic assessments for online students is seen as key to ensuring retention (Rust et al., 2015). Both residential and online services are supported by early warning systems that employ predictive analytics and extensive communications to identify and address academic, social, and financial factors that might otherwise negatively impact retention (Arnold et al., 2010; Braxton et al., 2014; Herodotou et al., 2020).

A third important tool that administrators have traditionally relied on to strengthen first-year retention is *student financial aid*, which is often distributed in the form of need-based aid for those who meet federal financial criteria and merit-based aid based on academic or extra-curricular achievement (Alon, 2011; Doyle, 2010; Gross et al., 2015; Haynes, 2008). Financial aid is typically awarded during initial enrollment (i.e., the first phase of retention) to ensure institutional fit and shape the culture of the incoming student cohort, but administrators also leverage student financial aid to strengthen first-year completion (i.e., the second phase of retention). For residential students, administrators use customized combinations of need-based aid (grants and loans) and merit-based aid (scholarships) that close the gap between cost and available funds to ensure that financial stressors do not contribute to dropping out and increase the likelihood of first-year students returning the following year (Herbaut & Geven, 2020; Pratt et al., 2019). For online students, financial aid packages have predominantly emphasized need-based aid in the form of federal grants and loans more than merit-based scholarships from institutions (Mettler, 2014). However, as the line between residential and online students has become less clear with many students taking classes in both modalities, financial aid packages have become more customized in their combinations of need- and merit-based aid for both residential and online student populations (Qayyum et al., 2018). To support these burgeoning financial aid processes, administrators have established intricate data management systems to oversee the computation and communication of financial aid information promptly to both residential and online students (Perry, 2018).

Using Retention Tools amid the Pandemic

At the onset of the pandemic, education scholars argued that given the nature of previous research on student retention, institutions would need to focus immediate attention predominantly on *student services* and *student financial aid* to ensure the crisis did not differentially impact the persistence of students most at risk of dropout (Blankenberger & Williams, 2020). The onset of the pandemic in early Spring 2020 only partly disrupted *specialized curriculum* efforts as most orientation curricula had already concluded by March, leaving administrators focused on shifting specialized instruction for first-year residential students to an online modality in conjunction with all other university courses during campus closures. As the pandemic persisted into the Fall 2020 semester, orientation and specialized instruction for first-year students shifted entirely to online, but with many institutions re-opening

their campus in the Fall of 2021, classes for residential students largely returned to an in-person modality in part or whole (Carrasco, 2021a; Collier et al., 2021).

Early institutional responses to the pandemic predominantly focused on shifting as many residential *student services* as possible to an online modality, one that mirrored broader institutional strategies that focused on closing residential campuses, shifting to online instruction, and adopting flexible academic policies such as pass/fail grading (Reich, 2020; Reza, 2020). A variety of campus-based services could not functionally transfer to the online modality, including childcare, elder care, dining services, disabilities services and health services, while others such as tutoring and counseling were already offered in a remote format for online students (Carrasco, 2021b; Chierichetti, 2020). However, the surge of residential students accessing these services in a virtual format limited the availability of services previously established to retain online students. At the same time, the inability to convert some student services from in-person to online modalities exacerbated inequities in the areas of food insecurity, mental health, access to reliable technology and childcare, particularly for minoritized and lower socio-economic students who had relied on them in order pursue their academic goals (Aucejo et al., 2020; Goldrick-Rab, 2020; Harper, 2020; Rodríguez-Planas, 2020). Both the scarcity and absence of these services impacted the confidence of at-risk students in their ability to return to school.

Student financial aid was an important retention tool for institutional leaders at the onset of the pandemic. Colleges and universities relied heavily on initial guidance from the US Department of Education regarding modifications to federal financial aid policies, which included suspending requiring federal approval for distance learning, a continuance of work-study funding, and refunds for discontinued enrollment (e.g., stemming from the cessation of study abroad programs) (Redden, 2020a). Within days of these announced federal financial aid policy changes, institutional leaders began to close residential campuses and refund the costs and fees associated with on-campus living (Redden, 2020b). In addition, administrators attempted to "stretch" existing need-based and merit-based aid by reducing tuition and fees, accepting delayed payments and canceling planned tuition increases (Seltzer, 2020). They also acted quickly to improve retention by decreasing the negative financial impact of the pandemic on students using emergency grants and federal COVID-19 relief funds to pay off student debt (Weisman, 2021; Whitford, 2020). Financial aid personnel who previously relied heavily on face-to-face communications for residential students immediately transitioned most communications to email, resulting in longer response times to resolve scholarship matters and refunds for campus services (such as food service and residence halls) due to closures (McKinnon-Crowley, 2021). As the pandemic progressed, financial aid appeals known as "professional judgment requests" substantially increased following the revised guidance from the US Department of Education that permitted university financial aid personnel to adjust student eligibility based on extenuating circumstances (A. Smalley, 2021). Institutional changes to financial aid policies do not indicate a focus on online student populations.

Out of necessity, the initial response from colleges and universities to the pandemic was universally focused on residential students. In contrast, institutional responses to existing online students either lagged or are not well understood. While education advocates and scholars readily argued that institutions needed to quickly focus on retaining residential students disproportionately impacted by the pandemic (Aucejo et al., 2020; Goldrick-Rab, 2020; Harper, 2020), they neglected to extend the same attention toward existing online students who may be impacted by the disproportionate allocation of financial aid, reduction in student services and widespread contextual changes that impacted *all* students regardless of modality type. In

addition, online students have historically been more likely to be members of underrepresented student populations and have responsibilities as caretakers and/or full-time employees that potentially limit their ability to effectively navigate academic demands (Morris et al., 2005). If residential students who transitioned online were confronted with retention and persistence challenges amidst a global pandemic, existing online students likely faced similar or even more severe challenges.

Yet the unequal attention paid to residential versus online learners throughout the COVID-19 global pandemic has remained obscure due to the continued marginalization of online learners as well as the lack of comparable institutional data across residential and online modalities. This study overcomes these barriers to bring increased awareness to the important yet overlooked topic of first-year online retention amid the pandemic and whether it differed from residential students within the same institutional context.

Method

Participants

Deidentified student records were obtained from a large university with a nearly identical undergraduate curriculum offered to online and residential students. To understand how COVID impacted educational outcomes, we contrasted two cohorts of students: those enrolled two years prior to COVID and those enrolled during the COVID pandemic. The overwhelming majority of students were enrolled as full-time students (defined as at least 12 credit hours per semester), with approximately 1% of students considered part-time in each of the two cohorts. For each cohort, we consider two timepoints, first year Fall semester and second year Fall semester. A binary second-year enrollment variable was determined by course enrollment data obtained from the registrar's office. For the pre-COVID cohort, these two semesters corresponded to Fall 2017 and Fall 2018. For the COVID cohort, these two semesters corresponded to Fall 2019 and Fall 2020. Thus, for those students in the COVID cohort, the COVID pandemic occurred after the start of the first year Fall 2019 semester and was ongoing during the second-year Fall 2020 semester. This resulted in a final sample of N = 10,348 students in the pre-COVID cohort and N = 12,196 students in the COVID cohort. See Table 1 for additional demographic details of the sample.

Table 1
First-Year Student Demographic Characteristics by Cohort

	Pre-COVID									
	White		Black		Hispanic		Asian		Total	
	N	%	*N*	%	*N*	%	*N*	%	*N*	%
Gender										
Female	3,141	42.9	798	10.9	375	5.1	90	1.2	4,404	60.2
Male	2,218	30.0	386	5.3	258	3.5	53	0.7	2,915	39.8
Total	5,359	73.2	1,184	16.2	633	8.7	143	2.0	7,319	100.0
Modality										
Online	3,274	44.3	1,069	14.6	448	6.1	80	1.1	4,844	66.0
Residential off-campus	1,034	14.0	36	0.5	85	1.2	24	0.3	1,179	16.1
Residential on-campus	1,093	14.9	79	1.1	101	1.4	39	0.5	1,132	17.9
Total	5,374	73.3	1,184	16.1	634	8.6	143	2.0	7,335	100.0
	COVID									
	White		Black		Hispanic		Asian		Total	
	N	%	*N*	%	*N*	%	*N*	%	*N*	%
Gender										
Female	3,955	43.7	924	10.2	508	5.6	111	1.2	5,498	60.8
Male	2,644	29.2	485	5.4	338	3.7	85	0.9	3,552	39.3
Total	6,599	72.9	1,409	15.6	846	9.4	196	2.1	9,050	100.0
Modality										
Online	4,202	46.3	1,258	13.9	654	7.2	122	1.4	6,236	68.8
Residential off-campus	312	3.4	22	0.2	18	0.2	11	0.1	363	4.0
Residential on-campus	2,098	23.1	132	1.5	177	2.0	63	0.7	2,470	27.2
Total	6,612	72.9	1,412	15.6	849	9.4	196	2.2	9,069	100.0

Note: Demographics represent sample prior to imputation of missing data. Final sample is comprised of 22,544 students that include pre-COVID (*N* = 10,348) and COVID (*N* = 12,196) students. Not all percentages add to 100 due to rounding error.

Analyses

We examined differences in student retention between residential and online students brought about by the COVID pandemic using the following logistic regression:

$$P(y_i = 1) = \frac{e^{\boldsymbol{\beta x}_i}}{1 + e^{\boldsymbol{\beta x}_i}}, \quad (1)$$

in which y_i represents a dichotomous indicator variable equal to one if student *i* was enrolled second-year Fall semester, zero if not, and $\boldsymbol{\beta}$ represents a vector of regression coefficients associated with covariate vector $\boldsymbol{x}_i$. Three main effect predictors included COVID cohort, modality and race (given the disproportional impact of COVID on communities of color). The COVID cohort variable was a dichotomous indicator variable equal to one for those in the COVID cohort and zero for those in the pre-COVID cohort. The modality variable takes on three categories, including online students, residential off-campus students, and residential on-campus students. Due to small sample sizes in other racial/ethnic categories, we focused on students who

identified as White, Black, Hispanic, and Asian American for the race variable, which allowed for greater insight into differential outcomes for various racial/ethnic groups. Three covariates were also included in the model. To control for socio-economic status, we included Federal estimated family contribution (EFC), a measure of student financial ability. We also controlled for gender (0 = Female, 1 = Male) and whether a student was enrolled during first year Spring semester (0 = No, 1 = Yes).

We also explored potential moderating effects. Of most interest was a three-way interaction of COVID × modality × race that permitted the examination of whether race and modality moderate the relationship between COVID and retention second-year. Thus, the interaction allowed us to assess multiple student subgroups within the broader research question, "Did the COVID-19 pandemic impact the retention of first-year online students, and did the experiences of first-year residential students who transitioned online during the pandemic differ from those who were already online?"

Missingness

Preliminary analyses revealed missing data was relatively low, with only three variables having any missing data. Specifically, approximately 27% (n = 6,140) of students had missing values of race, 36% (n = 8,195) of students had missing values of estimated family contribution, and 0.3% (n = 61) students were missing values of gender. As a result, patterns in missing data were further probed. Little's (1988) multivariate test of Missing Completely at Random (MCAR) indicated the data did not meet the assumptions of MCA missing data mechanism, χ^2 (9) = 133.3, $p < .001$ (Rubin, 1976). To mitigate against bias in parameter estimates due to missing data, multiple imputation was conducted using Stata software (14.2; StataCorp, 2015), in which a fully conditional specification technique was employed using the multivariate imputation with chained equations (MICE) command. This approach allows for a combination of categorical and continuous variables to be imputed simultaneously by not imposing certain distributional assumptions (van Buuren et al., 2006). Including all variables to be used in the analyses as well as highly correlated auxiliary variables in each imputation model, a total of m = 20 replicated data sets were produced (Enders, 2010; Graham et al., 2007). Analyses were conducted on each imputed data set, with final parameter estimates and standard errors pooled from each model (Rubin, 1987).

Results

Log-coefficient estimates from the logistic regression were exponentiated to be interpreted as odds ratios (ORs), in which OR values greater than 1 indicate increased odds for a particular group in comparison to another, while OR values less than 1 indicate decreased odds. Estimated ORs for both main effects and interaction effects are reported in Table 2. Of the covariates, only first-semester retention (i.e., enrolling first year Spring semester) was predictive of students returning the following Fall (OR = 11.606, $p < .001$). Results indicated that, on average, compared to online students, those students in residential off-campus (OR = 8.23, $p < .001$) and residential on-campus (OR = 1.77, $p < .001$) settings were significantly more likely to be retained. This finding can be interpreted as "students in residential off-campus / residential on-campus housing are 8.23 / 1.77 times more likely to be retained their second-year than online

students." The results show first-year online students are the least likely group of students to be retained across *both* cohorts and *all* race subgroups.

Regarding the cohort main effect, students in the COVID cohort were significantly less likely to be retained their second-year than students in the pre-COVID cohort (OR = 0.72, $p < .001$). However, results of the two-way interaction of COVID × modality revealed a more nuanced finding; a test of joint significance indicated a significant interaction effect ($F_{(2,928)} = 82.9$, $p < .001$). While COVID students had lower retention rates, this effect was felt significantly more by students in residential off-campus housing than online students (OR = 0.19, p < .001). Conversely, the negative effects of COVID were felt significantly less by students in residential on-campus housing than online students (OR = 2.38, p < .001). This can be seen in Figure 1, which illustrates the effects of COVID on second-year retention, showing how these negative effects were more impactful for residential off-campus students and online students than residential on-campus students. Examining Table 2, it can also be seen that (on average) Black students (OR = 0.46, $p < .001$) and Hispanic students (OR = 0.75, $p = .030$) were significantly less likely to be retained than White students. Finally, the three-way interaction of COVID × modality × race was significantly negatively related to second-year retention for Black students in residential *on-campus* housing (OR = 0.48, $p = .049$). As the three-way interaction engulfs all two-way interactions and main effects, we focus on three-way interaction findings.

Figure 1. Two-way interaction of COVID × Modality

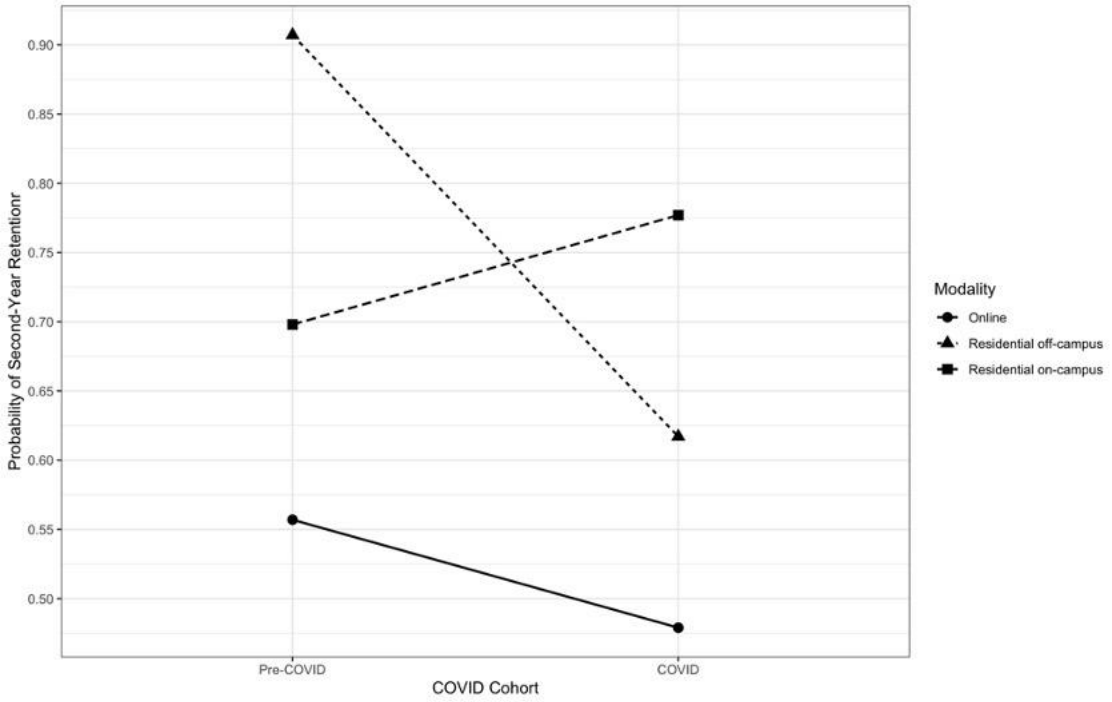


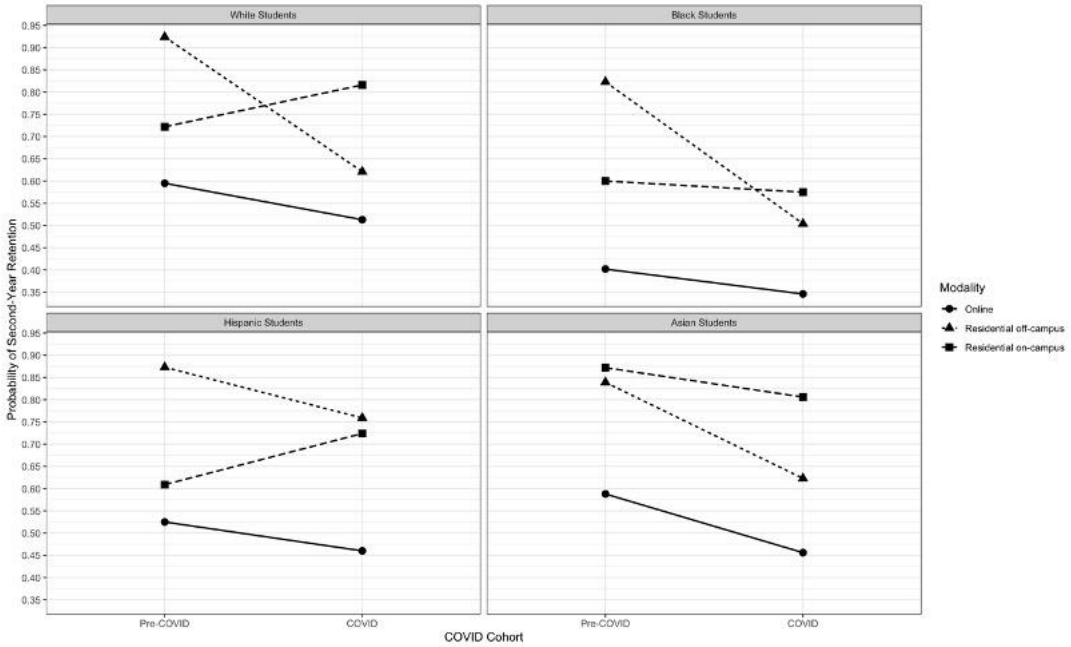
Table 2
Impacts of COVID on Probability of Second-Year Retention

Variable	Odds Ratio	SE
COVID[1]	0.717***	0.035
Modality[2]		
Residential off-campus	8.233***	1.046
Residential on-campus	1.768***	0.149
COVID × Modality		
COVID × Residential off-campus	0.189***	0.034
COVID × Residential on-campus	2.383***	0.261
Race[3]		
Black	0.457***	0.038
Hispanic	0.752*	0.097
Asian	0.972	0.245
COVID × Race		
COVID × Black	1.101	0.12
COVID × Hispanic	1.076	0.17
COVID × Asian	0.818	0.272
Modality × Race		
Residential off-campus × Black	0.878	0.523
Residential off-campus × Hispanic	0.760	0.311
Residential off-campus × Asian	0.457	0.318
Residential on-campus × Black	1.268	0.378
Residential on-campus × Hispanic	0.799	0.213
Residential on-campus × Asian	2.783	1.836
COVID × Modality × Race		
COVID × Residential off-campus × Black	1.406	1.105
COVID × Residential off-campus × Hispanic	3.227	2.516
COVID × Residential off-campus × Asian	2.798	2.917
COVID × Residential on-campus × Black	0.479*	0.179
COVID × Residential on-campus × Hispanic	0.915	0.315
COVID × Residential on-campus × Asian	0.424	0.344
EFC	1.009	0.005
Male[4]	0.953	0.033
Enroll Spring[5]	11.604***	0.469

*$p < .05$, **$p < .01$, ***$p < .001$
N = 22,544
Note: Referent groups are Pre-COVID[1], Online[2], White[3], Female[4], and Not Enrolled in Spring[5].

To aid in interpretation, additional analyses were conducted to further probe the three-way interaction, including plotting the effect. Figure 2 provides a graphical depiction of the effects of COVID by modality on retention for White, Black, Hispanic, and Asian students separately. This allowed us to answer the question, "Does the two-way interaction of COVID × modality differ for different racial/ethnic groups?" Our results demonstrate that while the two-way interaction effect of COVID × modality was significant (i.e., the negative effects of COVID on second-year retention were felt less, on average, for students in residential on-campus housing than online students, as shown in Figure 1), this effect was not the same for all races. For Black students in residential on-campus housing, the two-way interaction effect was more influential than for White students in residential on-campus housing. This is also demonstrated visually in Figure 2. While the negative retention effects of COVID were on average lessened for residential on-campus students compared to online students, the slope of the line for Black students in residential on-campus housing is negative, while the slope of the line for White students in residential on-campus housing is positive. Interestingly, we did *not* find that online students from underrepresented racial subgroups were differentially disadvantaged from their residential counterparts in the COVID cohort.

Figure 2. Three-way interaction of COVID × Modality × Race.



Discussion & Implications

We use two distinct lenses to further discuss the implications of this study—premises related to the broader field of higher education and propositions targeted more specifically toward financial aid policy and practice. Our analyses yield findings that suggest as higher education seemingly emerges from the peak of the COVID pandemic, a more inclusive and nuanced approach to retention tools is called for, and a closer examination of one of them—financial aid policy and practice—reveals how targeting the unique needs of online students could begin to address the challenges related to retaining this population.

Premises for the Field of Higher Education

Premise 1: Environmental factors negatively impacted both residential and online students.

The data from our study show that students who enrolled during the pandemic reported lower retention rates in both the online and residential modalities, suggesting that the concerns of those advocating for actionable responses on behalf of residential students early in the pandemic were certainly warranted (albeit were one-sided). The school in question converted to an online format within a matter of weeks for residential students, but for those students already studying online—who did not experience a sudden shift in modality as their residential peers—we would expect to have *not* seen a reduction in retention as a result of the pandemic. However, these data show that like their residential classmates, online students experienced a significantly similar reduction in retention during the pandemic. The source of the reduction in retention for online students may be due to the broader impact of the pandemic that influenced all students, but contrary to what many have assumed (or even overlooked), the impact on online students retention-wise was just as significant as it was for residential students. This suggests that while online students may not have been confronted with the abrupt challenges associated with closing a residential campus and its services and shifting to a different modality for learning, the online student population experienced other environmental factors during the pandemic that had a significant impact on their ability to persist with their education.[1]

Premise 2: Racial inequality persists across learning modalities.

Our research highlights that after controlling for socio-economic status, the negative effects of the pandemic on retention were felt significantly more by Black and Hispanic students than White students in *both* the online and residential modalities. White students were more likely to be retained during the pandemic than their Black ($p < .001$) and Hispanic ($p = 0.030$) peers (see Table 2). As other works that examine populations of online students have shown, the accessibility of the online modality has commonly appealed to traditionally underserved populations (Morris et al., 2005; Shaw et al., 2016; Xu & Xu, 2020). Our research sample reflects similar demographic characteristics as it yielded a considerably higher proportion of Black and Hispanic online students than our residential sample. As such, any reduction in the retention of online students disproportionately impacts Black and Hispanic students. Our results also illustrate how race may also influence residential retention due to the pandemic.

Premise 3: Hybrid models of educational delivery necessitate hybrid retention solutions.

This study highlights the need for more inclusive retention solutions, broadened in their conceptualization to incorporate minoritized and underrepresented students from across multiple modalities. Much has been made about ensuring that institutions consider underserved populations beyond academics and address insecurity regarding basic needs that puts them at risk (Goldrick-Rab, 2020). The findings from this study extend such calls to suggest that advocacy on behalf of students should equally include "unseen" online students just as much as their "seen" residential peers. We found that online first-year students were less likely to be retained than residential first-year students irrespective of cohort, and any expected advantage for online students due to the lack of a sudden shift in instruction modality did not emerge. This suggests that institutions and policymakers may need to consider crafting retention tools uniquely targeted to the needs of online students.

[1] These factors impacting online students were diverse in nature, including "Zoom fatigue," social isolation, loss of employment or furlough, technological access/reliability and travel restrictions.

Propositions for Financial Aid Policy and Practice

While the challenge of retaining online students will require innovations that span the range of retention tools noted above, a closer consideration of one of them—financial aid policy and practice—can offer insights into how schools can go about crafting solutions that address the particular needs of these students.[2]

Proposition 1: Consider how the retention tool of financial aid can be used across modalities.

As more institutions continue to adopt hybrid models of educational delivery—particularly given the pandemic necessitated the widespread adoption of online instruction and services—financial aid administrators must consider how practices in one modality might be applied in another. Specifically, are there financial aid approaches within the institution common for residential students that have yet to be extended to online students? For example, financial aid policy at the federal and institutional levels should not limit campus work-study opportunities solely to residential students. As the pandemic has shown, if university employees can utilize remote options for work, might these same options also be extended to online students with abilities to conduct research, process data, and other employment possibilities conducive to remote work? Financial aid leaders might begin by commencing with a comprehensive review of their practices to compare extant differences between residential and online processes, policies, financial resources (i.e., scholarships, aid, etc.), and service availability (i.e., hours of operation). These internal "equality assessments" could begin to address questions of similarity and disparity that exist across modalities, such as whether a financial aid type is applied equitably to students regardless of educational modality and whether residential students receive a greater amount of institutional aid in proportion to the differential price of tuition. With the pandemic having upended traditional norms of educational delivery, institutional leaders have an ideal opportunity to identify areas of financial aid comparability between the two student populations to bring them into further alignment and parity.

Proposition 2. Use financial aid in innovative ways to improve retention.

While prior research on financial aid and retention has called for the strategic use of financial aid use beyond enrollment processes (Olbrecht et al., 2016), the pandemic forced financial aid policymakers and administrators to creatively envision how financial aid might be leveraged outside of its primary arena in admissions processes (i.e., phase one of retention) and used to improve the immediate circumstances of first-year students already attending the institution (i.e., phase two of retention). In the spirit of the oft-cited dictum of never letting a crisis go to waste, financial aid policymakers and administrators should use the recent experience of the pandemic to refashion the role they play beyond the admissions process to include improving first-year retention and persistence to graduation for online students. Rather than merely relying on informational "nudging" to urge students to persist using texts, administrators might employ financial "nudging" that incentivizes students to persist using progressive forms of institutional financial aid (Bird et al., 2021; Page et al., 2020). Such efforts would have the added benefit of assisting institutional leaders with addressing any potential performance-based metrics associated with future funding.

At the same time, financial aid could be innovatively combined with other retention tools (i.e., specialized curriculum and student services) at different inflection points to improve retention for online students. For example, administrators might consider coupling financial aid

[2] While we focus on financial aid in what follows, we see room for similar kinds of creative responses available to schools via other avenues (e.g., leveraging flexibility within federal work-study guidelines for online students).

with early warning systems used by student services or pair a financially modest one-time micro-scholarship (i.e., a nudge) with the completion of a specialized curriculum (e.g., a specific course, tutorial, remediation program or orientation). A progressive curriculum "ladder" could strategically extend across a multi-year period that might incentivize students to earn these incremental merit-based micro-scholarships throughout their college experience rather than solely within the admissions process. This approach might particularly benefit Black, Hispanic, and other minoritized students who may experience more encouragement and persist in their postsecondary pursuits more through strategic monetary nudges than just informative ones.

Administrators may also be able to combine financial aid with advising to help students optimize their financial aid dollars or with career services to enable students have a higher likelihood of paying off their student loans. Given the unique character and needs of online students, these changes in how financial aid is used should be strategically crafted to meet their needs, but these insights are equally applicable to improving the retention of their residential peers. By strategically coupling multiple retention tools (i.e., specialized curriculum, student services, and financial aid) across multiple phases (i.e., enrollment, first year, and persistence to graduation), administrators may be able to successfully compound institutional retention rates.

Proposition 3. Perceive institutional aid as a democratic investment in students.

One of the goals of need-based financial aid is to shape broader society in ways that change the trajectory of people's lives. Myriad advocates have called for change in the for-profit sector of higher education with its emphasis on generating revenues by predominantly enrolling minoritized and first-generation students in online programs that yielded high financial margins (Cottom, 2017; Iloh, 2016; Ruch, 2003). With many colleges and universities having established hybrid models of student enrollment in recent years by adding online programs, some institutions may see an "opportunity" to similarly pursue the low-cost / high margin approach toward higher education associated with for-profit institutions like the University of Southern California did (Ryan & Hamilton, 2019). Financial aid professionals could lead the way in safeguarding their institutions against such exploitive practices by leveraging need-based institutional aid to advocate for the retention and persistence of minoritized or underrepresented populations pursuing their academic endeavors online. They should as well lead the charge in helping college and university leaders re-envision what institutional support looks like for these students, such as pursuing resource parity across institutional sectors (James Relly, 2021) by (for example) providing institutional aid for technology to online students in ways they may be similarly supporting room and board for residential students. Coupling this type of financial support for technology (i.e., "digital room and board") with the remote work-study options previously suggested could strategically equip Black and Hispanic students that disproportionately reported lower levels of retention across both residential and online modalities with the added resources they need to finish college. Using need-based financial aid and institutional monies to support unseen online students presents an opportunity to strategically shape future citizens based on democratic principles.

Limitations and Future Research

Although thoughtful attention was given to records retrieval, data queries, modeling social processes and data analysis, limitations to this study persist. First, these data were drawn from a single university. All universities manifest their own unique culture and context, which limits generalizability across institutional types. For example, the university in this case was a

predominantly White university (PWI), which may have influenced some of the results observed in the residential sample. The two cohorts were also observed at different times. It is possible that differences in retention were not a result of COVID but some other factor during the same time period that may have influenced retention in the respective cohorts. A final limitation concerns subgroup sample sizes and the research design. Notably, the cross-sectional nature of the data along with the analytic plan does not allow for causal inferences. This limits our ability to conclude that differences in retention may have been caused by the pandemic. In a related vein, subgroup analyses and interaction effects may be underpowered due to small sample sizes (e.g., $n = 22$ Black students in the COVID cohort in residential off-campus modality; see Table 1). However, much of this uncertainty is captured in larger standard errors for some of the estimates.

As more institutions adopt hybrid enrollment models, future research should investigate whether financial aid awards between the two types of student groups—residential and online—are equitable. Providing comparable amounts of financial aid resources between student groups would ensure minoritized and underrepresented online students are not doubly marginalized in comparison to their residential peers. Additional research is needed to examine the extent to which there is parity in student support and academic support between residential and online student populations within institutions. More specifically, future studies should interrogate how levels of student and academic support vary across institutional types (community college, research, liberal arts, minority serving, two-year, public/private, etc.) to further inform how dominant models of retention may need modified so as to include students pursuing their college degree in different modalities (i.e., residential, online, hybrid) (Baker et al., 2021). Finally, the pandemic underscored that financial aid can be widely used beyond its dominant emphasis on admissions processes at all levels of undergraduate and graduate enrollment. It is imperative that future studies ascertain whether specific financial aid tools are more effective at certain stages of the collegiate experience. Further insights in this area will help administrators and policymakers alike more effectively allocate resources in a manner that promotes the progressive retention of both residential and online students.

Conclusion

Amid the myriad hardships inflicted by the pandemic, one positive outcome that has emerged is to confirm the legitimacy of online learning to successfully support learning. As a result, this has lent urgency to the need to heighten awareness of the kinds of students served by this modality and how best to craft inclusive policies and procedures that meet their unique needs. Moments of crises are often catalysts that bring about institutional reevaluation and new ways of doing things—often necessitating that leaders act in expedited and innovative ways that might have taken years to achieve under normal conditions. The COVID-19 pandemic catalyzed university administrators and policymakers to immediately alter retention and financial aid practices beyond the customary approaches in higher education. While their efforts were certainly warranted, the focus and attention overlooked the large population of online students already studying in a digital modality. This research highlights that the academic outcomes of students in *both* residential and online modalities were negatively influenced by environmental factors and that racial inequalities also persisted across *both* modalities during the onset of the pandemic. Its findings suggest that not only must administrators consider an equitable distribution of financial resources, but scholars and education advocates must also consider more

inclusive forms of advocacy that incorporate both the seen and unseen populations of marginalized students who commonly exist within the same institution.

Making a college education accessible to disadvantaged and underserved populations through online education offers immeasurable value to students, institutions and broader society. Maximizing that value requires investing in online students in ways we have traditionally supported residential students—starting with creatively deploying an innovative set of retention tools suited to their circumstances and contexts. To reduce the chances that online students might be doubly marginalized, policymakers and administrators should work in tandem to bring about equal attainment for all students regardless of whether they may be pursing their educational ambitions in a residential or online learning modality.

Research Declarations

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