

**Minority Student Access in the Online Environment**

Conway, Katherine <sup>1</sup>; Wladis, Claire <sup>2</sup> and Hachey, Alyse <sup>3</sup>

<sup>1, 2 and 3</sup> Borough of Manhattan Community College

Using registration and transcript data, the authors explored differences in online course enrollment across different student groups. This study revealed that minority students do not enroll in online courses to the same extent as their White student peers, but the effect size for the difference in participation rates was small. However, the actual difference between minority students online vs. face-to-face enrollment was five percentage points, a difference equivalent to about 150 minority students per year, given the College's current enrollment rates, so the impact of this small difference is not insignificant. An even greater issue is that Black and Hispanic students, regardless of the course delivery medium, continue to have lower G.P.A. s than their White and Asian/Pacific Islander (PI) student peers. This finding reinforces prior research that suggests Black and Hispanic student groups need additional support in order to be successful in college, and that greater recruitment efforts for online courses are needed for all minority groups.

Prior research has also shown that students who enroll in online courses at the college have higher G.P.A.'s than students who enroll in face-to-face courses; however, this study reveals a notable exception to this pattern. Black, Hispanic and White students who select online courses are better prepared (as denoted by G.P.A.) than students who select face-to-face courses, suggesting that the weaker students in these groups are influenced by academic experience in

their decision not to enroll in online classes. Among Asian/PI students, however, there is no significant difference between students who select face to face versus online courses, suggesting that there are differences in the factors that determine online enrollment in this group compared to others. This leaves open some important questions about online enrollment and its relationship to student G.P.A. among different ethnic groups. In this case, why are Asian/PI students with higher G.P.A.'s choosing not to register for online courses at the same rate as students from other ethnic groups?

## **Introduction**

With recent social and economic changes in the United States, higher education has never been in greater demand. College enrollments in the fall of 2008 increased at rates not seen in the past 40 years, led by growth in community colleges, increased enrollment of minority students and the rise of online classes. Overall enrollment in community colleges in 2008 grew 11%, continuing their mission to provide access for minorities, students of lower socio-economic status and those students not served by traditional four year colleges and universities (Shannon & Smith, 2006). Minority student enrollments in higher education that year, particularly Hispanic and Black students, increased 15% and 8% respectively, continuing a trend of higher high school graduation rates and college enrollments for these populations (Fry, 2010).

Faced with unprecedented demand, yet also constrained by economics and space, colleges are responding by offering more courses online. Unlike in the past, when colleges added to their existing bricks and mortar to meet demand and a mature community college system was described as one in which 90-95% of the population resided within 25 miles of the campus, today's community colleges no longer define themselves by geographic limitations, and facing

fiscal constraints, look to technology to expand course offerings (Cohen and Brawer, 1996; Jones, 2003). The result is an explosion in online course enrollments, surging more than 20% in the last school year alone and outpacing higher education enrollments overall for the past seven years (Allen & Seaman, 2011).

Providing another pathway to higher education, online learning courses have become a core feature of services offered at most colleges and universities (Downes, 2005). Leading the way in this method of instructional delivery are public community colleges, with nearly all community colleges currently offering some form of online education (Parsad, Lewis & Tice, 2008). Community colleges as early adopters is not surprising, as online learning has been touted as a potential agent of social change, offering minorities an opportunity to attain previously inaccessible education while addressing the unique needs of underrepresented, isolated and frequently marginalized cultures (Langier, 2003). Students from minority cultures have been shown to exhibit feelings of isolation from the majority culture found on most campuses (Enger, 2006; Langier, 2003) and online learning may offer a social process that can allow students and faculty to transcend cultural barriers.

However, the promise of online learning for traditionally underrepresented groups is under-researched and perhaps not being realized. Buzzetto-More & Sweat-Guy (2006) conducted an extensive review of the literature that revealed that there is a substantial lack of research focusing specifically on Black college students with respect to online learning. Additionally, there is relatively little research on Hispanic college students in the distance learning environment, and what is available suggests that community college online learners are typically not of Hispanic origin (Halsne & Gatta, 2002). And at least one study found that

ethnicity was not a factor in online course completion (Aragon & Johnson, 2008), however, these results have not been substantiated with further research. Overall, despite the rapid growth in online course offerings and the large numbers of community college students coming from traditionally underrepresented groups, there is very little knowledge about enrollment patterns in online courses in general (Frankola, 2001; Maxwell, 2003), and of minorities at community colleges in particular. It seems clear from the gap in the literature that not enough is known about inclusiveness in online learning and that research is needed to guide potential interventions.

### **Purpose of the Study**

Instruction which relies heavily on technology may appear to be culturally neutral but in fact may make assumptions based on the dominant culture. The internet is dominated by both English language and Western ideologies, and can also emphasize learning autonomy, all of which might disadvantage students whose identity is with a non-western culture or a culture which encourages cooperative learning or relies on external referents (Chen, et al., 1999; Joo, 1999). African American and Hispanic cultures are more field dependent (reliant on external referents) for example than Anglo-Americans, even though all three groups may have been raised in close geographic proximity to one another (Duroyde and Hildreth, 1995). Given the rise of online learning at the community college level, combined with high minority populations as enrollees, it is important to address differences in student demographics in order to determine if the rise of online courses offers the intended goal of equity and inclusion. This study seeks to assess if students from traditionally underrepresented groups are accessing online courses, specifically:

- Do Black and Hispanic students have lower enrollment rates in online courses, once G.P.A., course and instructor are controlled?
- To what extent does prior college success, as measured by G.P.A., interact with ethnicity to predict online enrollment?

If there are differences in access for minority groups in online learning, it lends support to the argument that the digital divide is still a valid educational concern in higher education and that online learning may not yet be meeting the unique learning needs of minority students. Such a finding could have great impact on directing attention to culturally-sensitive online course design, the need for targeting recruitment efforts and the need for providing additional support services for traditionally underrepresented students who enroll in online courses.

## **Review of the Literature**

### *The Digital Divide*

For many years, interest has focused on the digital divide, which is “patterns of unequal access to information technology, based on income, race, ethnicity, gender, age and geography” (Mossberger, Tolbert & Stansbury, 2003, p.27). During the last two decades, research has supported the existence of a digital divide in schools within the United States, with higher-needs schools typically having less access to technology than their lower needs counterparts (Chapman, Masters & Pedulla, 2010). Within schools, data indicate disparities with traditionally underrepresented students, particularly African-American and Hispanic populations. In addition to access, ethnic differences in online interactions have been noted as a factor (Shachaf & Horowitz, 2006; Raymond & Blomeyer, 2007).

There are, however, a number of researchers who suggest that the digital divide is “disappearing on its own” (Compaine, 2001, p.334). They point to data that poor families are

adopting the internet at a faster rate than rich families as support for minimizing government and educational intervention or data which shows internet use in the U.S. growing faster among Blacks and Hispanics than among Whites and Asians (U.S. Department of Commerce, 2002). Yet, this contention may not be accurate. Recent U.S. statistics indicate that ethnic background and other demographic characteristics still have substantial impact on the availability and use of computers by students outside of the school classroom (Morgan & VanLengen, 2005). Blacks and Hispanics are less likely to have computers in the home than either Whites or Asians, a disparity which is even greater among children than adults. The leading causes for this disparity are education and income (Fairlie, 2007).

Regardless of the debate on the digital divide, there is no debate that minority students, particularly Hispanic and African American students, attend college at a lower rate, and graduate at a lower rate, than their White peers. Among students who began at a two-year college, Black and Hispanic students had the lowest rate of degree attainment after six years, at 28% and 34%, compared to an overall degree attainment rate of 41% (NCES, 2003). Given this disparity in graduation rates, the increase in community college enrollments led by minority students, and the growth of online enrollments, more data on minority student enrollment in the online environment is crucial in order to better understand, and meet, the needs of different student populations.

### *Black and Hispanic Students in Higher Education*

During the last three decades, college enrollments among Black and Hispanic students rose significantly. The biggest gainers were Hispanic students, who accounted for 4% of college students in 1976, and 11% in 2007. Black student enrollment also grew, from 9% to 13% during the same time period (U.S. Department of Education, 2009a). Yet despite gains in access,

graduation rates for these student groups lags behind that of their White student peers. For students who began college between 1996 and 2004, degree completion rates among Black and Hispanic students at both two-year and four-year colleges were lower in every cohort. Graduation rates were measured at 150% of the time required to complete the degree, or in the case of community colleges at 3 years versus 2 years. The lowest graduation rates were at public two-year institutions, much like the one in this study. For the most recent cohort, only 20% of students nationally received either a degree or certificate in three years, with Black and Hispanic students faring much worse at 11.5% and 15% respectively (U.S. Department of Education, 2009b).

#### *Grade Point Average as a Predictor of Student Success*

Several researchers (see Rovai, 2003 for a review) have noted a significant relationship between previous academic performance (as denoted by G.P.A.) and completion of online learning courses. Some studies point to a lingering effect of poor first-year college performance, with a very high risk of drop out if students have a first-year G.P.A. below 2.0 (Nora, Barlow and Crisp (2005). This is supported by research by Diaz (2002), who found that successful students in an online course had a higher average G.P.A. prior to enrollment (avg. G.P.A. = 3.02) than unsuccessful students (avg. G.P.A. = 2.25) and Muse (2003), who cites G.P.A. as one of several significant factors affecting online retention at the community college level.

#### **Background**

A preliminary investigation of data taken from 2007-2008, which prompted this study, revealed that both the percentages of students of each racial/ethnic group enrolled in online courses and the rates of completion for online courses by race/ethnicity show statistically significant variation among the different groups. For example, online courses contain a higher

percentage of White students and a lower percentage of all other ethnic groups than is present in the college's population at large, and this difference is statistically significant for all groups (see Table 1).

These preliminary data suggest that further research is necessary in order to determine if students in certain minority groups truly are enrolling in online courses at different rates.

Without a more controlled study, it is impossible for us to know if the trends in the preliminary data will hold once we control for G.P.A., instructor and course type.

**Table 1. Percentage Enrollment by Race/Ethnicity, Spring 2008**

	White	Black	Hispanic	Asian/Pacific Islander
<b>Online Classes (N=1024)</b>	24.0	34.0	29.0	12.0
<b>Student Body (N=19,611)</b>	16.0	37.0	32.0	14.0
<b>z-statistic</b>	5.99	-2.03	-2.12	-1.97
<b>P-value</b>	<0.0001**	0.0212*	0.0170*	0.0244*

p < .05, \*\*p < .01

## Methodology

### *The Institution*

The college which is the focus of this study is a large urban community college, classified as both a Minority Serving Institution and a Hispanic Serving Institution. The Higher Education Act of 1965 gave special recognition as Minority Serving Institutions (MSIs) to postsecondary schools whose enrollment of a single minority or a combination of minorities exceeds 50 percent of the total enrollment. The term "minority" is defined as American Indian, Alaskan Native, Black (not of Hispanic origin), Hispanic (including persons of Mexican, Puerto Rican, Cuban, and Central or South American origin), Pacific Islander or other ethnic group (Higher Education



Act, 1965). The college studied is also classified as a Hispanic Serving Institution (HSI). HSI's enroll the majority of Hispanic students in the United States (Santiago, 2006) and are defined as "institutions that have at least a 25% Hispanic undergraduate (FTE) enrollment, with at least 50% of its Hispanic students coming from a low-income background and being first generation in their family to attend college and an additional 25% being low income or first generation" (Poley, 2008, p.76). Minority Serving Institutions (MSIs), although they account for less than 3% of colleges and universities, educate approximately 35% of the U.S. minority population. MSIs often have low graduation rates because their students share many of the risk factors that result in high attrition: part-time attendance, full-time employment, lack of parental support and a gap in enrollment after high school (Cook & Cordova, 2006; O'Brien & Zudak, 1998).

The community college in this study enrolls approximately 23,500 students from more than 150 countries, with 85% of students self-identifying as minority. Black students comprise one-third of the enrollment, Hispanic students constitute 37%, Asian and White students each represent 15%. The size of the institution studied is also noteworthy. Large institutions, those with greater than 15,000 total enrollments, constitute 14% of all institutions with online offerings, but educate nearly two-thirds (64%) of all online students (Allen & Seaman, 2010). The college's mission to "extend higher educational opportunity to a diversified urban population...and to sustaining full access" speaks directly to the reasons cited by two-thirds of all colleges for offering online courses: to meet student demand for flexible schedules and to provide access to those who might not otherwise be able to attend college (BMCC, n.d.; Parsad, Lewis & Tice, 2008).

Data for this research was provided by the College's Office of Institutional Research. Online courses are those in which at least 80% of the course content is delivered online.

Traditional courses are those which deliver the primary content orally or in writing, though these courses may have some online component (the instructor may post a copy of the syllabus online or accept assignments electronically) (Allen & Seaman, 2011).

Specifically, data was requested for 122 course sections, half of which were taught online and the other half of which were taught face-to-face. The online course sections in this data set were chosen from a larger pool in the following way: First all online courses taught at the college from 2004-2010 in either the fall or spring semester were identified. Next, the list of courses were reduced to include only those course sections for which the same instructor taught the same course both face-to-face and online in the same semester. Then the selection was further limited to only those courses for which there were at least three semesters during which pairs of online and face-to-face course sections were taught by the same instructor. A wide distribution of courses that covered both upper and lower level courses in career, liberal arts, STEM and non-STEM disciplines across a distribution of course subjects were identified. Then, from this selection of courses, a random number generator reduced the number of courses until for each course there were exactly three pairs of online and face-to-face sections, so that each pair was taught by the same instructor in the same semester. Additionally, the sample was reviewed and reduced such that no one course by discipline, level of difficulty or instructor was disproportionately represented in the sample, and to ensure that the sample was representative of the breadth of the college's online (and insofar as possible, face-to-face) course offerings.

For every student enrolled in the courses on this list, information was collected on the student's ethnicity and G.P.A. at the beginning of the semester in which the course was taken. Ethnicity is self-reported by students on their admission forms. In instances where ethnicity is not reported, the variable is imputed by the Office of Institutional Research and Assessment (OIRA) at the

University of which this College is a part. OIRA uses a statistical procedure called Discriminant Analysis<sup>1</sup> to assign a race/ethnicity value to students who did not report their race/ethnicity.

Student data was provided without identifiers and with unique identification numbers. This resulted in a total data set with 2330 participants; an overview of the dataset can be seen in Table 2. For some students, G.P.A. was missing, so the actual *N* for many analyses was reduced (see individual analyses for specific *N*). Certain categories were reduced to a smaller number of levels so that the subsample sizes could be large enough for reasonable analysis. In particular:

- For ethnicity, there were four categories: Asian or Pacific Islander (often abbreviated as Asian/PI), Black, Hispanic, and White. The college also has one additional category of classification, “American Indian or Native Alaskan,” but there were only three students total in this category in the sample, so this category was removed.
- G.P.A. was treated as a categorical variable for some analyses in order for the statistical methods to be more tractable; in these cases, the following groups are used: <2.5, 2.5--3.49, 3.5-4.0.

**Table 2. Dataset Overview**

<b>Categories</b>	<b><i>N</i></b>	<b>%</b>
<b>face-to-face</b>	1329	57.0
<b>online</b>	1001	43.0
<b>Asian/PI</b>	311	13.4
<b>Black</b>	835	35.9
<b>Hispanic</b>	768	33.0
<b>White</b>	413	17.7
<b>G.P.A. &lt;2.5</b>	638	31.7

<sup>1</sup> Discriminant Analysis “classifies cases into one of several mutually exclusive groups based on their values for a set of predictor variables” (SPSS For Windows, 1999) which for ethnicity imputation, includes college attendance, gender, full-time/part-time status, class standing, degree status, residency, last name and zip code. Information for students whose race/ethnicity is known is used in the classification phase of Discriminant Analysis. Then based on the classification data, probabilities are assigned to each unknown case.

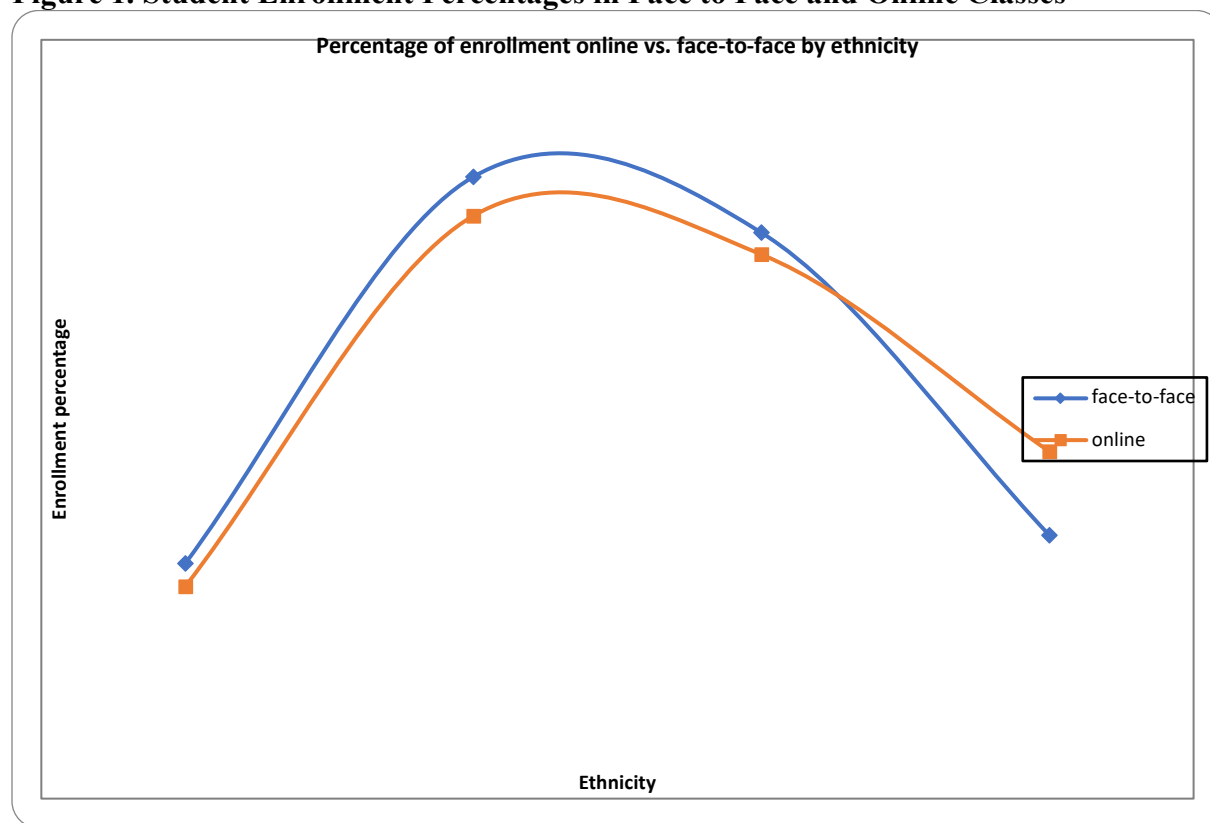
2.5-3.49	982	38.8
3.5-4.0	394	19.6

## Results and Discussion

### *Analyzing Enrollment Patterns*

The differences in enrollment based on ethnicity which were present in the preliminary analysis above still appear when instructor and course taken are controlled, although the effect size is smaller. We began by looking at enrollment percentages by ethnicity for both online and face-to-face courses and assess whether the percentage of each ethnicity enrolled in online courses is statistically significantly different from the percentage enrolled in face-to-face courses. The results are shown in Figure 1 and Table 3.

**Figure 1. Student Enrollment Percentages in Face to Face and Online Classes**



The differences between online and face-to-face percentages for each group are not large enough to be statistically significant, and we can see that the effect sizes are fairly small. Because a similar pattern was observed in other samples of online students at the college (White students have an increased percentage of online enrollment at the expense of all other ethnic groups), we suspect that the differences would be statistically different with a large enough sample size (probably at least double the size of the current sample).

**Table 3. Student Enrollment by Ethnicity in Face to Face and Online Courses Showing Significance and Effect Size**

Ethnicity	Face-to-face %	Online		z	p	d
		N	%			
Black	36.9	489	34.6	0.69	ns	0.05
Asian or Pacific Islander	14.0	185	12.6	0.35	ns	0.04
White	15.6	207	20.6	-1.31	ns	-0.13
Hispanic	33.6	445	32.3	0.38	ns	0.03

Because these patterns may be non-significant simply because sample sizes in each subgroup are too low to reach the threshold of significance, we compare White face-to-face vs. online enrollments and pool all other ethnicities together to compare face-to-face vs. online enrollments. When Asian, Black and Hispanic students are pooled together, there is a highly statistically significant ( $\alpha=0.01$ ) result, with a *p*-value of 0.0025 (see Table 4).

**Table 4. Pooled Student Enrollment by Ethnicity in Face-to-face and Online courses.**

Ethnicity	Face-to-face %	Online		z	p	d
		N	%			

<b>White</b>	15.6	207	20.6	206	-1.31	ns	-0.13
<b>NonWhite<sup>1</sup></b>	84.4	1119	79.4	795	2.81	0.0025**	0.13

\*\*  $p < .01$

1 Black, Hispanic and Asian Pacific Islander

This suggests that the proportion of non-White ethnic groups is in fact smaller in online courses than face-to-face courses, although the effect size is small, indicating that these differences are relatively minor (much smaller, for example, than the differences in G.P.A.'s among different ethnic groups), which is why the sample size was not sufficiently large to detect differences for the individual Black, Hispanic and Asian ethnic groups individually. Therefore, it can be concluded that there probably is a small difference in enrollments among different ethnic groups (but that this difference is relatively minor in comparison to other areas in which minorities are often underrepresented, such as many STEM fields). However, even a small effect can be significant in its impact; for example, in this study, the difference in minority enrollment online vs. face-to-face is five percentage points. Because the college's online courses enroll several thousand students each year, which amounts to approximately 150 minority students each year who are missing the opportunity to engage in online learning.

#### *Analyzing Ethnicity and G.P.A. Patterns*

The next goal of this study was to see to what extent G.P.A. varies by ethnicity, so as to determine to what extent any differences in enrollment among different ethnic groups online and face-to-face might be due to underlying G.P.A. differences rather than ethnicity directly. We began by analyzing whether students in different ethnic groups have different G.P.A. distributions at the college, both overall and when looking at subgroups of online and face-to-

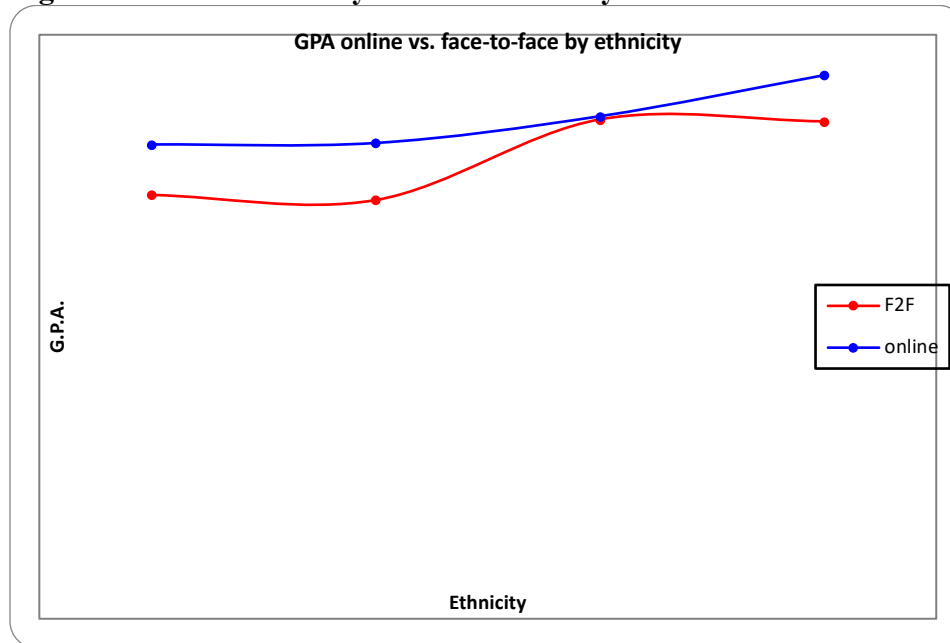
face students. The distribution of G.P.A. is displayed in Table 5 and Figure 2, and the results of the ANOVA in Table 6 below.

**Table 5. Mean G.P.A. Distribution by Student Ethnicity**

<b>Ethnicity</b>	<b>Mean G.P.A. of Students Selecting Face to Face Courses</b>		<b>Mean G.P.A. of Students Selecting Online Courses</b>	
		<b>N</b>		<b>N</b>
<b>Black</b>	2.54	469	2.84	331
<b>Hispanic</b>	2.51	424	2.85	306
<b>Asian/Pacific</b>	2.99	181	3.01	123
<b>White</b>	2.98	196	3.26	201

By looking at Figure 2 several interesting trends are observed. Overall, Asian/PI and White students have much higher G.P.A.'s than Black and Hispanic students. Among students who elect to enroll in online courses, Black and Hispanic students have much lower G.P.A.'s than White students, and Asian students are somewhere in the middle. In addition, for most ethnic groups, there is a clear G.P.A. gap between students who elect to enroll in online courses versus face-to-face courses; students choosing to take courses online tend to have higher G.P.A.'s.

**Figure 2. Mean G.P.A. by Student Ethnicity and Selected Course Delivery Type**



This result is not surprising, since it repeats results encountered in previous research (Hachey, Wladis & Conway, in press). However, there is one interesting exception to this trend: Asian/PI students do not seem to have this gap; while their G.P.A.'s in face-to-face courses are relatively high compared to other groups, their G.P.A.'s online are more towards the total group average for all ethnicities while the G.P.A.'s of Asian/PI students who selected face-to-face courses are relatively high compared to other groups, the G.P.A.'s of Asian/PI online students are close to the total group average for all ethnicities. To determine whether any of these patterns were statistically significant, we ran a two-factor ANOVA with G.P.A. as the dependent variable and online/face-to-face status and ethnicity as the two independent variables.

It is clear that the overall model is significant, since the  $p$ -value of the  $F$  statistic returned by the ANOVA is  $<0.0001$  (see Table 6). Details about which factors were significant are shown in Table 7, where it is evident that both course delivery type and ethnicity were highly



statistically significant ( $\alpha=0.01$ ), with  $p$ -values of  $<0.0001$ , and that the course type by ethnicity interaction was statistically significant ( $\alpha=0.05$ ) with a  $p$ -value of 0.026.

**Table 6. Two-Factor ANOVA with G.P.A. as Dependent Variable**

F	Pr>F
25.95	<0.0001**

\*\*p < .001

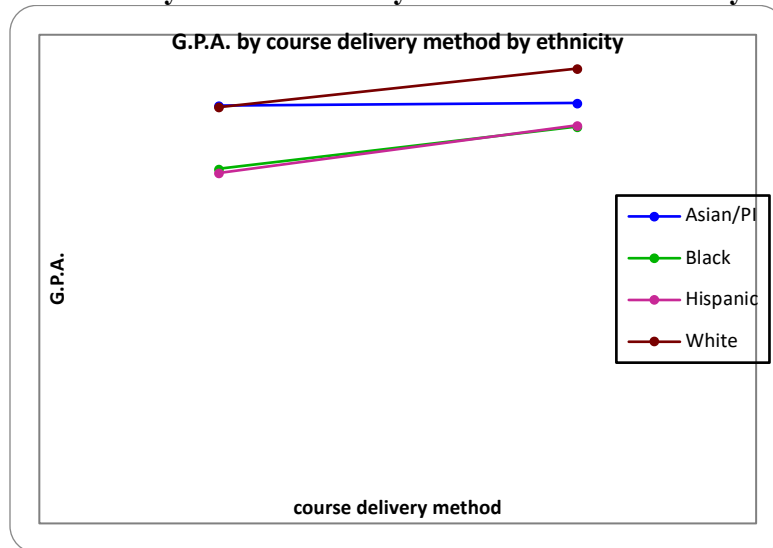
This suggests that not only do the course delivery type and ethnicity individually correspond to marked differences in G.P.A., but that the differences in G.P.A. in each ethnic group when comparing online to face-to-face students are also different in both magnitude and possibly direction (this corresponds to different slopes for different ethnic groups in Figure 3 below).

**Table 7. Type III Sums of Squares Analysis For Two Factor ANOVA with G.P.A. as the Independent Variable**

Source	DF	Sum of squares	Mean squares	F	Pr > F
course type	1	23.977	23.977	41.070	< 0.0001**
ethnicity	4	66.620	16.655	28.528	< 0.0001**
course type*ethnicity	3	5.413	1.804	3.091	0.026*

p < .05, \*\*p < .01

**Figure 3. G.P.A. by Course Delivery Method Selected and by Ethnicity**



As shown in Table 8, the differences among most of the ethnic groups are highly statistically significant ( $\alpha=0.01$ ); in fact, there seems to be a clear divide between Asian/PI/White students and Black/Hispanic students based on these results.

**Table 8. Pairwise Comparison Test for Single Factors**

Contrast	Difference	Standardized difference	Critical value	Pr > Diff
Hispanic vs White	-0.439	-8.832	2.569	< 0.0001**
Hispanic vs Asian/PI	-0.322	-5.895	2.569	< 0.0001**
Hispanic vs Black	-0.011	-0.267	2.569	0.993
Black vs White	-0.428	-8.734	2.569	< 0.0001**
Black vs Asian/PI	-0.311	-5.762	2.569	< 0.0001**
Asian/PI vs White	-0.117	-1.919	2.569	0.220

\*p < .05, \*\* p < .001

In Tables 9 and 10, the results of pairwise comparison tests (Tukey HSD tests performed post hoc on selected interaction terms) are shown. Table 9 shows that the difference in G.P.A. between students selecting online and face-to-face classes holds for Black and Hispanic (highly statistically significant with  $\alpha=0.01$ ) and White (statistically significant with

$\alpha=0.05$ ) students, but not Asian/Pacific Islander students, for whom the difference in G.P.A. is nonsignificant.

**Table 9. Pairwise Comparison Tests for Interactions: Comparing Ethnicity in Different Course Environments**

Contrast	Difference	Standardized difference	Critical value	Pr > Diff
<b>F2F*Hispanic vs online*Hispanic</b>	-0.34	-5.82	3.10	< 0.0001**
<b>F2F*Black vs online*Black</b>	-0.30	-5.36	3.10	< 0.0001**
<b>F2F*White vs online*White</b>	-0.28	-3.45	3.10	0.016*
<b>F2F*Asian/PI vs online*Asian/PI</b>	-0.02	-0.21	3.10	1.000

\*p < .05, \*\* p < .001

Given the trends in other ethnic groups, we would expect the G.P.A.'s of Asian/PI students taking courses online to be about three-tenths of a point, or about one-third of a letter grade higher than they actually are.

**Table 10. Pairwise Comparison Tests for Interactions: Comparing Ethnicities in the Same Course Environment**

Contrast	Difference	Standardized difference	Critical value	Pr > Diff
<b>F2F*Hispanic vs F2F*Black</b>	-0.03	-0.57	3.10	1.000
<b>F2F*Hispanic vs F2F*Asian/PI</b>	-0.48	-6.83	3.10	< 0.0001**
<b>F2F*Hispanic vs F2F*White</b>	-0.472	-6.758	3.102	< 0.0001**
<b>F2F*Black vs F2F*Asian/PI</b>	-0.453	-6.504	3.102	< 0.0001**
<b>F2F*Black vs F2F*White</b>	-0.441	-6.428	3.102	< 0.0001**
<b>F2F*White vs F2F*Asian/PI</b>	-0.012	-0.142	3.102	1.000
<b>online*Black vs online*Hispanic</b>	-0.01	-0.15	3.10	1.000
<b>online*Hispanic vs online*Asian/PI</b>	-0.160	-1.928	3.102	0.594

<b>online*Hispanic vs online*White</b>	-0.406	-5.739	3.102	< 0.0001**
<b>online*Black vs online*White</b>	-0.415	-5.929	3.102	< 0.0001**
<b>online*Black vs online*Asian/PI</b>	-0.169	-2.052	3.102	0.507
<b>online*Asian/PI vs online*White</b>	-0.246	-2.736	3.102	0.135

\*p < .05, \*\* p < .001

In addition, as shown in Table 10, for students selecting face-to-face courses, there is a highly statistically significant difference ( $\alpha=0.01$ ) between G.P.A.'s for Black/Hispanic students vs. Asian/PI/White students; for students selecting online courses, there is a highly statistically significant difference ( $\alpha=0.01$ ) between G.P.A.'s for Black/Hispanic students vs. White students (Asian/PI online students have G.P.A.'s that are closer to Black and Hispanic students compared to White students, but which are not statistically significantly different from any of the other ethnic groups).

## Implications

### *For Practice*

This research suggests that increased effort is needed in recruiting non-White ethnicities into online courses if we are to achieve completely representative participation in the online environment for all ethnic groups.

In addition, the overall lower G.P.A. in both the face-to-face and online environment for Black and Hispanic students suggest that more resources may need to be allocated to the support of these groups specifically. By contrast Asian/Pacific Islander students tend to have higher G.P.A.'s overall, but in the online environment have lower G.P.A.'s than might be expected given

the pattern evidenced by other student groups. This suggests that for Asian/PI students their underrepresentation in online courses may be due to factors other than G.P.A.

#### *For Future Research*

The differences in enrollment by ethnicity in online courses which were observed in this study were only detected when non-White ethnicities were pooled together to create a larger sample size. An obvious next step would be to obtain a larger sample size and to see if the same statistically significant differences could be observed in individual ethnic groups, and to see if the resulting effect sizes are still small. Ideally, a sample would be large enough to delve further into the differences among ethnic groups, because labels, such as Asian, Hispanic and Black, span a multitude of ethnic groups, and do a disservice to all ethnicities. Additionally, racial and ethnic differences should also be considered in the context of English language skills and differences of economics and family education.

In addition to enrollment patterns, future research should explore both success as measured by grades in the online environment and retention for these student groups. Given the controls for both instructor and course in this study, results that indicate higher overall G.P.A. in the online versus the face to face environment also warrant further investigation.

#### **Limitations**

This research was conducted on a specific sample of courses at the college which is the focus of this study, which could limit the applicability of these findings, since not all courses at the college were included. In addition, the college which is the focus of this study has a particular environment that is extremely diverse. The student population is overwhelmingly composed of groups that have traditionally been underrepresented in higher education, and a

number of faculty, staff, and senior administrators at the college come from these groups as well. As a result, differences in G.P.A., among different ethnic groups may be less (or more) pronounced than at other institutions, and therefore the applicability of these results to other online learning programs has some limitations.

Several of the results of this paper involved pooling two or more ethnic groups in order to obtain the number of entries needed in each cell to have suitable statistical power; however, this may have blunted some important distinctions between ethnic groups that were pooled together: for example, if there are any important distinctions between success rates for Black and Hispanic students in online courses with the same G.P.A., this study did not contain enough detail to pick up on these differences.

## **Conclusion**

At the college in this study, minorities enroll in online courses at rates that are lower than White students by a small but statistically significant amount. The proportion of non-White ethnic groups enrolled in online courses is significantly smaller than in face-to-face courses, although the effect size for this difference is small, indicating that these differences are relatively minor. However, even minor differences contribute to inequity (especially when the College's online enrollments are in the thousands each year). As a result, the five percentage point difference found in this sample between minority online and face-to-face enrollments amounts to approximately 150 minority students each year who are losing the opportunity to take courses online. This suggests that recruitment efforts to enroll students from all minority groups in online courses should be an important part of any e-learning program.

G.P.A. is also significantly different across ethnic groups, in both online and face-to-face courses, and there are some notable patterns when looking at the changes in G.P.A. when different ethnicities select to participate in the online environment. Asian/PI and White students have significantly higher G.P.A.'s than Black and Hispanic students overall, and prior research has also shown that students who enroll in online courses at the college have higher G.P.A.'s than students who enroll in face-to-face courses.

However, this study reveals a notable exception to this pattern once we look at ethnicity in detail. While Black, Hispanic and White students have comparable gaps in G.P.A. online vs. face-to-face (with significantly higher G.P.A.'s for students selecting online courses), Asian/PI students actually have the same G.P.A. whether they choose take a course online or face-to-face. It seems that for some reason, Asian/PI students with the highest G.P.A. s are choosing not to take courses online at the same rates as students with equivalent G.P.A. s from other ethnic groups.

This discrepancy raises a host of important questions. Is the gap in G.P.A. between students who take courses online and students who take courses face-to-face a good thing, because online courses often require a higher level of discipline and organizational skills, which are more likely to be prevalent among students with higher G.P.A. s? In other words, is this a sign that students are doing a good job of accurately assessing ahead of time whether or not the online environment might be right for them? Or is it something we should try to change, because with the ever-increasing importance of technology and the internet today, all students, regardless of G.P.A., should perhaps have online as well as face-to-face academic experiences? Does the fact that Asian/PI students who choose to register for online courses have the same G.P.A. s as

face-to-face students mean that we should try to create structures which incentivize students from all ethnic groups to choose online courses in the same way? Or is it a sign of something out of balance - does it indicate something holding back certain higher G.P.A. students in this group from taking courses online?

### **Acknowledgements**

The authors wish to thank Kimberly A. Gargiulo, Coordinator of Institutional Research and Assessment at Borough of Manhattan Community College for her support.

Financial support for this study was provided by a Borough of Manhattan Community College E-Learning Grant.

### **References**

- Allen, I.E. and Seaman, J. (2010). Class Differences: Online Education in the United States, 2010. Sloane Foundation Publication. Retrieved April 25, 2011 from [http://sloanconsortium.org/publications/survey/pdf/class\\_differences.pdf](http://sloanconsortium.org/publications/survey/pdf/class_differences.pdf)
- Aragon, S.R. and Johnson, E.S. (2008). Factors influencing completion and noncompletion of community college online courses. *The American Journal of Distance Education*, 22, 146-148.
- BMCC, (n.d.). Borough of Manhattan Community College, web page. Retrieved April 20, 2011 from <http://www.bmcc.cuny.edu>.
- Buzzetto-More, N.A. & Sweat-Guy, R. (2006). Incorporating the Hybrid Learning Model into Minority Education at a Historically Black University. *Journal of Information Technology Education*, 5, 153-164.



- Chapman, L., Masters, J., & Pedulla, J. (2010) Do digital divisions still persist in schools? Access to technology and technical skills of teachers in high needs schools in the United States of America. *Journal of Education for Teaching*, 36 (2), pp. 239-249.
- Chen, A., Mashadi, A., Ang, D. and Harkrider, N. (1999). Cultural issues in the design of technology-enhanced learning systems. *British Journal of Educational Technology*, 30(3), pp. 217-230.
- Cohen, A. M., & Brawer, F. (1996). *The American community college*. San Francisco: Jossey-Bass.
- Compaine, B. (2001) Declare the War Won. In B. Compaine (Ed.), *The Digital Divide: Facing a Crisis or Creating a Myth?* (p. 334). Cambridge, MA: MIT Press.
- Cook, Bryan J., and Diana I. Córdova. 2006. *Minorities in Higher Education: Twenty-Second Annual Status Report*. Washington, DC: American Council on Education.
- Diaz, D.P. (2002). Online drop rates revisited. *The Technology Source*, May/June. [http://technologysource.org/article/online\\_drop\\_rates\\_revisited/](http://technologysource.org/article/online_drop_rates_revisited/)) Retrieved: October 4, 2009.
- Downes, S. (2005). E-Learning 2.0. *eLearn Magazine* <http://www.elearnmag.org/subpage.cfm?article=29-1&section=articles>. Ret.: Oct.4, 2009.
- Enger, K.B. (2006). Minorities and Online Higher Education. *Educause Quarterly* 4 (November) pp.7-8.
- Fairlie, R. (2007) Explaining Differences in Access to Home Computers and the Internet: A Comparison of Latino Groups to Other Ethnic and Racial Groups," *Electronic Commerce Research*, 7, pp.265-291 retrieved May 20, 2011 at

<http://people.ucsc.edu/~rfairlie/papers/published/ecr%202007%20-%20latino%20technology.pdf>

Fast Facts 2011, (2011). American Association of Community Colleges, Retrieved April 24, 2011 from <http://www.aacc.nche.edu/AboutCC/Documents/FactSheet2011.pdf>

Frankola, K. (2001). The e-learning taboo: High drop-out rates in online courses. *Syllabus* 14 pp14-16.

Fry, R. (2010). Minorities and the recession-era college enrollment boom. *Pew Social and Demographic Trends*, Pew Research Center, retrieved April 25, 2011 at <http://pewsocialtrends.org/2010/06/16/minorities-and-the-recession-era-college-enrollment-boom/2/>.

Hachey, A.C., Wladis, C.W. and Conway, K.M. (*In Press*). Balancing Retention and Access in Online Courses: Restricting Enrollment... Is It Worth the Cost? *Journal of College Student Retention: Research, Theory & Practice*.

Halsne, A.M. & Gatta, M.A. (2002). Online Versus Traditionally-delivered Instruction: A Descriptive Study of Learner Characteristics in a Community College Setting. *Online Journal of Distance Learning Administration* 5(1), Spring.

Higher Education Act, 1965 SEC. 365. [20 U.S.C. 1067k] Definitions. Accessed April 25, 2011 at <http://www2.ed.gov/programs/itudesmsi/mseiplegislation.pdf>.

Hispanic Association of Colleges and Universities (n.d.) Membership: Hispanic serving institutions definitions. Accessed April 24, 2011 at [http://www.hacu.net/hacu/HSI\\_Definition.asp?SnID=1486169123](http://www.hacu.net/hacu/HSI_Definition.asp?SnID=1486169123)

Joo, J. (1999). Cultural issues of the internet in classrooms. *British Journal of Educational Technology*, 30(3), pp. 261-276.

- Jones, R. (2003). A recommendation for managing the predicted growth in college enrollment at a time of adverse economic conditions. *Online Journal of Distance Learning Administration* (6)1. Retrieved May 20, 2011: <http://www.westga.edu/%7Edistance/ojdl/spring61/jones61.htm> .
- Langier, J. (2003). Distance learning and the minority student: special needs and opportunities. *Internet and Higher Education*, 6, 179–184.
- Maxwell, W., Hagedorn, L.S, Cypers, S., Moon, H.S., Brocato, P., Wahl, K. & Prather, G. (2003). Community and Diversity in Urban Community Colleges: Course Taking among Entering Students. *Community College Review* 30 (4) pp.1-21.
- Morgan, J. & VanLengen, C. (2005) The digital divide and K-12 student computer usage. *Issues in Informing Science and Information Technology*, 2, 705-724.
- Mossberger, K., Tolbert, C. & Stansbury, M. (2003). *Virtual Inequality: Beyond the Digital Divide*. Washington, D.C.: Georgetown University Press.
- Muse, H.E. (2003). The web-based community college student: An examination of factors that lead to success and risk. *The Internet and Higher Education*, 6(3), 241-261.
- Nora, A., Barlow, E. and Crisp, G. (2005) Student persistence and degree attainment beyond the first year of college. In A. Seidmen (Ed.), *College Student Retention: Formula for Student Success* (pp. 129-310). Westport, CT: Praeger Publishers.
- O'Brien, E.M., & Zudak, C. (1998). Minority-Serving Institutions: An Overview. *Minority Serving Institutions: Distinct Purposes, Common Goals*. Jamie P. Merisotis and Colleen T. O'Brien. San Francisco, CA: Jossey-Bass.
- Parsad, B., Lewis, L. & Tice, P. (2008). *Distance education at degree-granting postsecondary*

- institutions: 2006-07*. No. NCES 2009-044, National Center for Education Statistics, U.S. Department of Education.
- Poley, J. (2008). Asynchronous Learning Networks: Policy Implications For Minority Serving Institutions And For Leaders Addressing Needs Of Minority Learners. *Journal of Asynchronous Learning Networks, Volume 12: Issue 2*
- Rovai, A. (2003). In search of higher persistence rates in distance education online programs. *The Internet and Higher Education, volume 6, issue 1, pp. 1-16*. [doi:10.1016/S1096-7516\(02\)00158-6](https://doi.org/10.1016/S1096-7516(02)00158-6) Retrieved April 25, 2011 at <http://dx.doi.org/>
- Santiago, D.A. (2006). Inventing Hispanic-Serving Institutions (HSIs): The Basics. Excelencia in Education and the Institute for Higher Education Policy: Washington, D.C.
- Shachaf, P., & Horowitz, S. (2006). Are Virtual Reference Services Color Blind? *Library and Information Science Research, 28*(4), 501-520.
- Shannon, H. D., & Smith, R. C. (2006). A case for the community college's open access admission. In B. K. Townsend & K. J. Dougherty (Eds.). *Community college missions in the 21st century* (pp. 15-21). San Francisco: Jossey-Bass.
- U.S. Department of Commerce. (2002). *A nation online: How Americans are expanding their use of the Internet*. Washington: U.S.G.P.O.
- U.S. Department of Education, National Center for Education Statistics. (2009a). [Digest of Education Statistics, 2008](#) (NCES 2009-020), Chapter 3.
- U.S. Department of Education, National Center for Education Statistics (2009b), 2001-02 to 2007-08 Integrated Postsecondary Education Data System, Fall 2001, and Spring 2002 through Spring 2008. June 2009.
- U.S. Department of Education (2003). National Center for Education Statistics, 1996/01

Beginning Postsecondary Students Longitudinal Study (BPS:96/01).