High-Impact Practices and Student Performance

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Using a sample of 1031 students from a public university, who responded to the NSSE survey in the Spring of 2018, this study explored the relationships between high-impact practices (HIPs) and several student academic performance metrics. Student responses to the NSSE HIPs participation questions were combined with their academic performance (GPA, credit hour completion, years-to-degree). Linear regression results show that the number of HIPS is a significant predictor of all academic performance metrics. The study also found significant differences between student populations and across course delivery modes regarding their participation in HIPs.

With the growing diversity of the student body entering college every year (Taylor et al., 2020), higher education institutions are under pressure to develop and offer educational opportunities that guarantee the success of all students to close the achievement gap. A report from the U.S. Department of Education (2016) indicated significantly lower academic performance for students of color and first-generation students compared to white students and that "degree completion rates are lower among black and Hispanic students than white and Asian students; nearly half of Asian students who enrolled in postsecondary education complete a bachelor's degree, compared with fewer than one in five Hispanic and about one in five black students" (p. 2).

Student diversity includes other relevant factors, such as their education's delivery modality. Recently, college and universities have been expanding their online course offerings and the National Center for Educational Statistics (2019) predicts an increase in students taking online courses by 2025.

While developing educational practices for each student population is challenging, growing student diversity necessitates universities and colleges build initiatives geared toward all students regardless of background or their preferred mode of instruction, online or in person. In other words, how can campuses support all students' learning and increase their chances of success? Are there practices that can help campuses support the success of all students?

High-Impact Practices

High-Impact Practices (HIPS) are educational activities that significantly enhance a college student's experience and performance (Kuh, 2008). High-impact practices have also been recognized for allowing students to take responsibility for their learning and persist (DiMaggio, 2017, 2019; Kuh, 2008; Pascarella & Terrenzini, 2005). Kuh (2008) identified the following 11 educational activities as high-impact practices, (1) first-year seminars and experiences, (2) common intellectual experiences, (3) learning communities, (4) writing-intensive courses, (5) collaborative assignments and projects, (6) undergraduate research, (7) diversity/global learning, (8) service learning/community-based learning, (9) internships, (10) capstone courses/projects, and (11) e-portfolios. Kuh describes each of these activities and explains why they are effective in promoting student success. Further research also reported HIPs' effects on closing the equity gap by greatly benefiting underserved student populations (Rodan et al., 2020; Kuh, 2008).

Accordingly, HIPs can be viewed as educational practices that allow students to develop essential skills like critical thinking, active learning practices, collaboration, integration of prior learning, a sense of belonging, etc. High-impact practices keep students engaged in their learning and ensure their academic success.

High-Impact Practices and Degree Completion

Degree completion is one of the main criteria by which higher education institutions are judged. Reports from educational scholars indicate an undergraduate degree completion rate of 56.9% after 6 years (Shapiro et al., 2018). Consequently, exploring ways and methods that can help improve degree completion rates is essential. Research has shown that HIPs can help students successfully complete their courses and degrees (Roldan et al., 2020) and promote learning gains (BrcKaLorentz, 2012). According to scholars (Kuh, 2008; Miller et al., 2005; Pascarella & Terenzini, 2005), HIPs are educational practices that could positively affect student outcomes, such as graduation rates, given their effectiveness in promoting and supporting student success.

Given the challenges imposed by the low 6-year graduation rate in higher education (Roldan et al., 2020), initiatives to help students complete a degree are underway in most colleges in the US. Research (Andrews, 2018) has found that students' exposure to HIPs can positively impact their journey toward successful degree completion. Similarly, Roldan et al. (2020) found significant differences between students who engaged in HIPs and those who did not, in terms of

their degree completion, even though such "gains were larger for students who were not members of underrepresented groups" (p. 41). The authors found that participation in HIPs significantly improved time to degree. Students who fully participate in HIPs tend to graduate faster than their counterparts. Similarly, McMahan (2015) reported a higher degree completion rate and higher GPA for students who participated in HIPs like undergraduate research or study abroad than those who did not.

Despite the benefits of HIPs on degree completion, efforts to positively support timely degree completion for all students, especially underserved student populations, are the focus of attention in colleges and universities. Such awareness is more warranted, given the diversity of incoming students who may have different needs. Hence understanding which student populations have access to HIPs seems to be a first step toward expanding HIPs' benefits to all students, especially since the proportion of underserved student populations enrolling in college has been increasing (National Center for Educational Statistics, 2019).

High-Impact Practices and Learning Gains

While attaining a degree may be the ultimate goal, continually meeting GPA and final grade requirements have been predictors of successful degree completion (Cardona et al., 2019). Consequently, instructional activities and practices that aim to help students achieve higher grades and GPAs along the way to degree completion should be emphasized in student success initiatives in higher education institutions. Moreover, students who can consistently meet grades and GPA requirements are more likely to persist and complete their degrees than others struggling to keep up with academic performance requirements.

Previous research has linked HIPs with higher learning gains (BrckaLorenz, 2012). Zhao and Kuh (2004) reported improved academic performance for students due to participation in HIPs and learning communities, more specifically. Research comparing students exposed to HIPs and other students not exposed to HIPs showed that the group of students exposed to HIPs had higher average final grades than their counterparts (Hall & O'Neal, 2016). In a study comparing student grades before and after a course redesign focusing on HIPs, Ganesh and Smith (2017) reported significant improvement in students' grades after redesigning courses to integrate HIPs. In another study, Roldan et al. (2020) found that students participating in HIPs have a significantly higher GPA than students who did not participate or even partially participated.

Most studies explored the positive effects of HIPs on degree completion. Still, investigating the impact of HIPs on factors that predict degree completion (i.e., final grades, credit hour completion rate, and GPA) can allow higher education institutions to establish processes to monitor early on whether students are on track to completing their degrees or not.

High-Impact Practices and Course Credit Hour Completion

While students who meet grades and GPA requirements are most likely to complete their credit hour requirements successfully, students' ability to complete enough credit hours will help them complete their degree faster. For example, unsuccessful students may have lower credit hour completion rates due to dropping courses for various reasons.

In addition to positively affecting degree completion, HIPs also positively impact students' abilities to complete their courses successfully. Bonet & Walters (2016) have associated HIPs with higher grades and course completion rates. The authors compare students in learning communities and other students in regular course sections. Results of the study showed that students in learning community courses were "far more likely than students enrolled in regular sections to complete the course with a passing grade" (p. 229). The authors reported a much lower failure rate in courses with HIPs components than in other courses.

High-Impact Practices and Online Learning

The growth of online learning in colleges seems to contrast with the literature's identified gap regarding HIPs' low availability in online courses (Linder et al., 2018; Perrotta, 2020). Challenges related to implementing HIPs online stem from applying some of them in the online learning environment and their effects on instructors' workload (Reynolds et al., 2020). Regardless, efforts to integrate HIPs in online courses must remain a priority given higher education institutions' aim to promote success for all students.

Despite challenges related to integrating HIPs online, the online learning environment provides instant feedback and collaboration opportunities beyond geographical boundaries that could support the successful implementation of HIPs in online courses. Researchers (Hess & Greer, 2016; Linder & Hayes, 2018, Chrysanthemum, 2018) provided step-by-step guidance on effective ways to implement HIPs in an online learning environment.

Given HIPs potential capacities to promote and support student academic performance and learning gains, it becomes imperative for higher education institutions to ensure students in online programs/courses have equal access and opportunities to be exposed to HIPs. Furthermore, universities are seeing

more non-traditional older students who most likely have family and professional responsibilities, making the online learning environment more appealing since they can study at their own pace to balance school, work, and life.

Consequently, universities and colleges hoping to effectively help students succeed must reach all students regardless of whether they are enrolled in online or face-to-face courses. Therefore, the growth of the online student population underscores the necessity for higher education institutions to clearly understand where HIPs are being offered and who is benefiting from them.

High-Impact Practices and Equity

This literature review highlighted the relationship between HIPs and student academic performance. While there is a growing body of literature focused on HIPs and student academic performance, there are mixed results regarding HIPs' effects on certain groups of students but not all (Sweat et al., 2013). The documented benefits of HIPs in closing the equity gap contrast with the fact that there still seem to be fewer underserved students having access to HIPS than their counterparts (Rodan et al., 2020; Kuh, 2008). According to Finley and McNair (2013), students in underserved groups who participated in HIPS reported higher learning gains, personal and social development, and perceived engagement in deep learning than their counterparts. Still, these effects were higher for their non-underserved student counterparts regardless of the reported greater effect of HIPS on the probability of African American/Black students returning the following year than their White/Caucasian counterparts as (Kuh, 2008) contended "Sadly, … some groups of historically underserved students are less likely to participate in high-impact activities" (p 17). Similarly, Kinzie (2019) reported lower HIPs participation levels for first-generation students (42%) compared to non-first-generation students (56%); while for other minority groups like African American/Black Students (40%), Hispanic-Latino (42%), Native Hawaiian/Pacific Islanders (38%) compared to White Caucasians (53%).

With the abundance of literature on HIPs and student performance, the focus seems to be on a *specific* high-impact practice such as learning community (Bonet & Walters, 2016), first-year experience (Roldan et al., 2020), or problem-based learning (Spedding et al., 2017)). The purpose of the current study is twofold:

1. Examine the effects of the total number of HIPs a student is exposed to, not a specific one, on student performance and across different course delivery modes. Considering delivery mode with HIPs becomes a priority with colleges and universities expanding their online course offerings.

2. Investigate whether HIPs are equitably affecting all student populations in a teaching university where a little more than one-third of the students are first-generation and online offerings have been significantly expanded in recent years. More specifically, the study addresses the following research questions.

Research Questions

1. Does the number of HIPs a college student is exposed to predict students' GPA, credit-hour completion rate, and years-to-degree?
2. Does the level of HIPs participation differ across varied student population groups?
3. Are there differences in student performance metrics for different student population groups?

Method

This study uses student responses from the National Survey of Student Engagement (NSSE) administered in Spring 2018 combined with additional student academic performance data provided by the Office of Institutional Research. The demographic variables like first-generation status, transfer status, course delivery mode, and under-represented minority (URM) status were generated from student profiles in the Office of Institutional Research database. Beside the demographic variables the following variables were also generated by the Office of Institutional Research.

Dependent Variables

The following student academic performance variables were used as dependent variables in this study:

- Cumulative GPA: This variable is the cumulative GPA for each student in the dataset as of Spring 2018.
- Semester GPA: This GPA is for the Spring 2018 semester
- Years-to-degree: This variable measured how many years it took students to graduate. This variable was only available for seniors
- Credit hour completion rate: This variable was created by dividing the attempted credit hours as of Spring 2018 by completed credit hours as of Spring 2018.

Independent Variable

Total HIPs: Students responding to the NSSE survey were asked to indicate whether they have done or are in the process of completing any of the listed HIPs. For this study, examples of applicable HIPS are internship, learning community, study abroad, undergraduate research, capstone courses/projects, and service learning.

This variable assigns a value of 1 to every one of these HIPs a student has been exposed to. Those scores are summed to create the total number of HIPs variable. This variable was based on self-reported data from the NSSE survey.

Data Analysis

Simple linear regression and mean comparison were used to analyze the data collected for this study in order to answer the posited research questions. For Research Question 1, simple linear regression prediction models were utilized to investigate whether the total number of HIPs a student is exposed to could predict the academic performance metrics used in this study.

For Research Questions 2 and 3, T-test analyses were utilized to investigate mean differences for total HIPs and the student academic performance metrics variables across the different student population groups.

Results

This section presents the results of the study for each research question. The sample characteristics and descriptive analysis of the variables used are also presented.

Participants

The sample consisted of 1,031 students and was broken down as follows in terms of student classification, with the majority of the sample being seniors (49%), followed by freshmen (32.3%), sophomores (18.5%), and Juniors (2%). Most of the students were enrolled in face-to-face programs (94.3%) compared to 5.7% being in online programs.

There were three first-generation status groups, with the first-generation group being the majority (48.1%), non-first-generation students (35.7%), and the unknown group (16.2%). This last group comprised students who did not identify as first-generation or not in their profile and was not included in the analyses for this study. Fourteen percent (14%) of the students were identified as belonging to the under-represented minority (URM) group. Only 21.1% of the sample were transfer students, and 78.9% were non-transfer students. Table 1 provides a descriptive analysis of student performance variables and the total number of HIPs.

Table 1

Sample Descriptive Information for Total HIPs and Student Performance Data

Variables	Mean	SD
Cumulative GPA	3.20	0.65
Semester GPA	3.19	0.85
Years-to-degree	4.93	3.76
Total HIPs	1.61	1.62
Credit hour completion rate	1.13	0.47

Research Questions

Research Question 1. Does the number of HIPs a college student is exposed to predict students' GPA, credit hour completion rate, and years to degree?

Simple linear regression tests showed that the total number of HIPs predicted:

Cumulative GPA. $F(1,888)=32.27$, $p=<.001$ with an R-square of .034 and Beta of .187, meaning a one standard deviation increase in total HIPs corresponds to a .187 increase in cumulative GPA. Table 1 reports standard deviations for each of the variables.

Semester GPA. $F(1,858)= 24.89$, $p=<.001$ with an R-square of 0.027 and Beta 0.168, meaning a one standard deviation increase in total HIPs corresponds with a .168 increase in semester GPA.

Credit Hour Completion Rate. $F(1,872)= 19.08$, $p<.001$ with an R-square of 0.021, Beta 0.146, meaning a one standard deviation increase in total HIPs corresponds with a 0.146 increase in credit hour completion rate.

Years-to-Degree. Years-to-degree data was only collected for seniors, and similarly, simple regression analysis also revealed that the total HIPs variable is a significant predictor of years-to-degree. $F(1,277)=16.36$, $p=<.001$ with an R-square of 0.056 and Beta 0.-237. In other words, one standard deviation increase in Total HIPs corresponds with a 0.237 decrease in years-to-degree.

These regression analyses also show that an increase in the total number of HIPs corresponds to an enhanced output in each student's academic performance-dependent variables in this study.

Research Question 2. Does the level of HIPs participation differ across varied student population groups?

T-tests were used to compare means for total HIPs across different student groups based on delivery mode, transfer status, first-generation status, and URM status.

For each of these analyses, Cohen's d effect size was reported using the following guidelines, 0.20 corresponding to a small effect, 0.5 as a medium, and 0.8 as a large effect (Cohen, 1998).

Course Delivery Mode (Online vs Face to Face). When HIPs participation was compared between online and face-to-face course students, the analysis revelated that online students have a significantly lower mean for total HIPS (Table 2), meaning that they are exposed to fewer HIPs than their counterparts.

Transfer. Results of the mean comparison show that transfer students have a higher number of total HIPS than their counterparts. The mean difference was significant (Table 3).

First-Generation. The first-generation variable was composed of two groups. The first-generation group and the non-first-generation group, after eliminating students whose first-generation status was reported as unknown. A t-test comparing first-generation and non-first-generation students was conducted. There were no significant differences between the two groups in terms of the number of HIPS they had been exposed to. A similar analysis with URM was not significant.

Research Question 3. Are there differences in student performance metrics for different student population groups?

Research Question 3 was a follow-up to Research Questions 1 and 2, which respectively established that while HIPs predict student performance metrics, the level of HIPS participation also varies across student groups. Therefore, Research Question 3 aimed to investigate whether student performance metrics, which are affected by the number of HIPs a student is exposed to, would also be different across the same student groups.

A mean comparison was utilized to test whether there would be differences in the performance metrics across student groups. Results for each of the student groups are reported next.

First-Generation. Results of the T-test show that first-generation students have a significantly lower mean than their counterparts for cumulative GPA (Table 4) and years to degree (Table 5) with a medium effect size. There were no significant differences for credit hour completion and semester GPA.

Transfer Students. Transfer students have a significantly higher mean than non-transfer students on cumulative GPA, semester GPA, and credit hour completion rate (Table 6). The analysis with years-to-degree (Table 7) shows that transfer students also have a significantly lower mean, meaning they tend to graduate faster than non-transfer students.

Under-Represented Minority (URM) Status Groups. Table 8 presents the results of the mean comparison of the academic performance metrics between URM status student groups. These results show that URM students have a significantly lower mean for both semester and cumulative GPA (Table 8). A similar analysis for years-to-degree was not significant.

Course Delivery Mode (Online vs Face to Face). There were significant differences between online and face to face in terms of years to degree with a large effect size (Table 9) but cumulative GPA, semester GPA, and credit hour completion were not significant.

Discussion

While most of the existing literature supports the relationship between specific types of HIPs: learning community (Bonet & Walters, 2016), first-year experience (Al Seeb, Abdulwahab, & Hamouda, 2017), undergraduate research, internship, and capstone (Zilvinskis 2019), writing intensive courses (Reynolds, Cai, Choi, Faller, Hu, Koshumam, Schwartzman, &Vohra (2020) and student performance, this study's findings contribute to the literature by providing insights into the relationship between the total number of HIPs, regardless of type, and student performance. In other words, the study provides insights into the *cumulative* effects of *multiple* HIPs on student performance. Understanding the cumulative effects of multiple HIPs can help universities and colleges better plan the introduction of HIPs throughout a student's journey rather than focusing on specific HIPs which may only be available in a limited number of courses. Furthermore, some HIPs (i.e., capstone, internships) may only be available in the later years of a student's educational career. Hence limiting their potential positive effects on the student performance metrics used in this study in the early years of a student's educational journey.

Results from this study are also consistent with previous research that found that HIPS can predict student academic performance and improve student outcomes such as time to degree. In this study, HIPs participation significantly predicted years-to-degree, credit hour completion rate, and both semester and cumulative GPA. Previous studies reported similar results (Kilgo et al., 2015). In that study, the authors noted that participation in HIPs, especially active/collaborative learning and undergraduate research, had significant positive effects on student learning and academic performance.

As indicated in the results of this study, the number of HIPs a student participates in can positively affect a student's ability to complete their degree faster. Prior research (Andrews, 2018) reported similar findings. In his study, the Andrews contended, "For every high-impact activity in which a student participated, their odds of attaining a bachelor's degree multiplied by a factor of 1.42" (p. 382). Such findings confirm the current study's

Table 2

Results of T-Test Comparing Total HIPs and Delivery Mode

	Online						95% CI			
	Yes			No						
	M	*SD*	*n*	*M*	*SD*	*n*		*t*	*df*	*Cohen's d*
Total HIPs	1.02	1.20	55	1.65	1.63	834	[0.19, 1.07]	2.81*	887	0.44

Note. ** p<.001, *p<.005.

Table 3

Results of T-test comparing Total HIPs and Transfer Status Groups.

	Transfer						95% CI			
	Yes			No						
	M	*SD*	*n*	*M*	*SD*	*n*		*t*	*df*	*Cohen's d*
Total HIPs	1.89	1.60	195	1.53	1.61	694	[-0.10, -0.61]	-2.81*	887	0.22

Note. ** p<.001, *p<.005.

Table 4

Results of T-Test Comparing Academic Performance Metrics Between First-Generation Status Groups

	First Generation						95% CI			
	Yes			No						
	M	*SD*	*n*	*M*	*SD*	*n*		*t*	*df*	*Cohen's d*
Cumulative GPA	3.11	0.68	495	3.26	0.68	368	[0.23, 0.05]	3.11*	862	0.22

Note. ** p<.001, *p<.005.

Table 5

Results of T-Test Comparing Years to Degree Between First-Generation Status Groups Among Seniors

	First Generation						95% CI			
	Yes			No						
	M	*SD*	*n*	*M*	*SD*	*n*		*t*	*df*	*Cohen's d*
Years to Degree	4.63	2.45	217	6.43	5.71	85	[2.77, 0.92]	3.93**	300	0.40

Note. ** p<.001, *p<.005.

results indicating that the *number* of HIPs a student participated in is a significant predictor of their progression to degree completion. The participants in this current study who have a higher number of HIPs seem to have a significantly higher credit hour completion rate than their counterparts.

Emphasizing the relationship between credit hour completion rate and HIPs is another way this study contributes to the literature. While most previous studies investigated the link between HIPs participation and successful course/degree completion, this study contributes to the literature by providing insights between HIPs and credit hour completion rate rather than course completion since completing a course may not necessarily mean a student is earning enough credits toward a timely graduation. While it is important for students to complete their courses, creating conditions to ensure that students earn enough credits by successfully completing all credit hours they attempted can help colleges and universities get students through the graduation pipeline faster. Therefore,

Table 6
Results of T-Test Comparing Academic Performance Metrics Between Transfer Status Groups

	Transfer						95% CI			
	Yes			No						
	M	*SD*	*n*	*M*	*SD*	*n*		*t*	*df*	*Cohen's d*
Credit Hour										
Completion Rate	0.97	0.08	216	0.93	0.15	794	[.06, .02]	-4.00**	1008	0.33
Cumulative GPA	3.31	0.50	218	3.17	0.68	813	[.23, .04]	-2.77	1029	0.23
Semester GPA	3.36	0.67	206	3.16	0.89	790	[-.06, -.33]	-2.99*	994	0.25

Note. ** p<.001, *p<.005.

Table 7
Results of T-Test Comparing Academic Performance Metrics Between Transfer Status Groups Among Seniors

	Transfer						95% CI			
	Yes			No						
	M	*SD*	*n*	*M*	*SD*	*n*		*t*	*df*	*Cohen's d*
Years to Degree	3.52	2.28	90	5.91	4.06	206	[5.95, 2.83]	5.37**	300	0.72

Note. ** p<.001, *p<.005.

Table 8
Results of T-Test Comparing Academic Performance Metrics Between URM Status Groups

	Under-Represented Minority						95% CI			
	Yes			No						
	M	*SD*	*n*	*M*	*SD*	*n*		*t*	*df*	*Cohen's d*
Cumulative GPA	2.91	0.75	144	3.25	0.62	887	[.45, .22]	5.91	1029	0.49
Semester GPA	2.86	1.00	143	3.25	0.81	853	[.54, .24]	5.19**	994	0.42

Table 9
Results of T-Test Comparing Years-to-Degree and Delivery Mode Among Seniors

	Transfer						95% CI			
	Yes			No						
	M	*SD*	*n*	*M*	*SD*	*n*		*t*	*df*	*Cohen's d*
Years to Degree	9.23	6.91	22	4.83	3.20	280	[5.95, 2.83]	5.53**	300	0.81

higher education institutions need to develop intentional mechanisms to monitor the implementation of HIPs in their courses and effectively track who is being exposed to HIPs and who is not.

The findings of this current study also provide insights into which student groups benefit most from HIPs. In the current study, online and non-transfer students have fewer HIPs. No significant differences were found in terms of total HIPs between first-generation and URM groups. However, first-generation and URM students have significantly lower achievement than their counterparts on some of the student performance metrics used in this study. Previous studies (Roldan et al., 2020; Finley & McNair, 2013) reported different results. In a study to assess underserved students' engagement in HIPs, Finley and McNair used data from 25,336 students who responded to the NSSE across 38 institutions, and first-generation students have a lower rate of HIPs participation (1.24) compared to non-first-generation students (1.45). In another study that explored HIPs engagement and degree attainment, Andrews (2018) reported that students in "disadvantaged groups are less likely to be involved in high-impact postsecondary activities" (p. 392).

Similar to the findings of this current study, Finley and McNair also found that transfer students tend to have higher education institutions need to develop intentional mechanisms to monitor the implementation of HIPs in a higher exposure rate than non-transfer students. In this current study, transfer students seem to have a higher mean for the number of HIPs they are involved with than non-transfer students. These findings counter some of the earlier research that found the opposite. In a study involving community college students, Zilvinskis and Dumford (2018) found that transfer students were less likely to engage with HIPs. These different findings could be due to the shorter time frame transfer students to community colleges might have compared to transfer students in 4-year colleges where they might come having already completed some HIPs from their previous institutions.

This study's findings also revealed different HIPs participation rates between face-to-face and online delivery. This might be due to the challenges related to implementing some of the HIPs in an online format, especially in asynchronous courses where it may be more difficult to keep students engaged since they are most likely working at their own pace. Prior research (Perrota, 2020) reported challenges facing the effectiveness of HIPs in online courses despite the growing literature on applying HIPs to online courses.

The findings of this study suggest that higher education institutions should consider strategies to engage disadvantaged groups more in HIPs. Universities could start monitoring students' engagement in HIP early on, beginning the first year, and maybe require at least one HIP every academic year for all students. This could help reduce the gaps between disadvantaged groups and others and also between delivery modes. Initiatives to intentionally expand HIPs opportunities across all student groups can help support inclusion and diversity initiatives currently being implemented in several higher education institutions. Furthermore, strategies to promote HIPs in online courses have become more urgent with the explosion of online learning in recent years as the number of undergraduate students taking online in the US is expected to increase by 15% in 2025 (National Center for Educational Statistics, 2019). Another recommendation for universities is to offer specific professional development opportunities for instructors to best integrate HIPs into online courses.

Limitations

One of the main limitations of this research is that HIPs participation was self-reported. Future research might be needed to develop more effective processes and mechanisms for higher education institutions to effectively and reliably track HIPs participation. Another limitation is that data were collected from one single institution. Further research on HIPs' effects under different institutional contexts and settings is also warranted.

The small sample size of online students is another limitation of this study. Further studies using comparable simple sizes of face-to-face and online students are needed to compare the effects of HIPs across delivery modes.

Conclusion

While this study confirmed previous studies regarding the effects of HIPs on student performance it also provides new insights into the cumulative effects of HIPs and the relationship between HIPs and a student's credit hour completion rate. The findings of this study also contrasted with previous studies regarding different student populations' participation in HIPs (i.e., first-generation), especially transfer students suggesting that transfer students at 4-year colleges may have different participation rates than those at community colleges. The study's findings have several implications for higher education institutions to develop mechanisms to support the expansion of HIPs across delivery modes and different student populations to improve student academic performance metrics, hence student success.

While reinforcing the literature on the positive effects of HIPs on student academic performance metrics, this research also highlighted the different *levels of access* to HIPs that different student populations have. Such findings could deter higher education institutions' efforts to promote equity and inclusion in their student success initiatives. Therefore, the main recommendation of this study is that higher education institutions need to *expand access* to HIPs since it predicts student performance, and to further ensure that such expansion is *equitably available* to all students regardless of demographic background or course delivery mode. As a baseline, a starting point could be for higher education institutions to develop an inventory of *where* HIPs are being offered and *who* is using them.

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