

Equitable Access: A Course Completion Rate Analysis from a 4-Year Institution

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Abstract: In higher education, course materials are experiencing an active disruption. This disruption is coming from equitable access, a course materials intervention model aimed at reducing the cost of and increasing access to course materials for students. The purpose of this study was to examine the use of an equitable access course materials model and its effect on student course completion rates. This study had a total population of 48,967. The analysis documented statistically significant differences between the before and after equitable access implementation samples for seven of the twelve categories examined. Black students (+1.75%), Pell grant students (+1.67%), Male students (+1.82%), Native American students (+16.51%), and Students Age ≥ 25 (+2.44%) had the largest increase in course completion rates when comparing the before and after equitable access implementation populations.

Keywords: course completion; equitable access, inclusive access, textbooks, student outcomes

Introduction

For nearly the last decade, the higher education course materials landscape has been entrenched in a period of transformation. This transformation might be better described as a revolution or active disruption to what has been tradition for over a century (Dean, 2022). This paradigm shift is the result of course materials interventions that aim to increase affordability of course materials while simultaneously increasing access (Leonard, 2022; Lorgan, 2022; Murphy & Shelley, 2020; The California State University, 2023; Polk Newsroom, 2022). A major driving force behind this shift has been the introduction of course materials intervention models known as inclusive access and equitable access. These programs are replacing the widely accepted and archaic ‘find and acquire’ course materials acquisitions model (Moore, 2022b). The ‘find and acquire’ acquisition model has

been in place since the inception of college and university bookstores. 'Find and acquire' models require students to complete three tasks before they can obtain their course materials. Students must figure out what course materials they need, where they are located, and determine if they have the financial resources to acquire them (David et al., 2015).

Historically, this model has led to higher education access barriers for students. Course materials have been cited as the reason a student doesn't take a particular course or delays entry into a course. Students even decide to pursue alternative majors and programs because of issues around acquiring the required course materials (Curiel, 2021; David et al., 2015; Florida Virtual Campus, 2018; Lorgan, 2022; Martin, et al., 2017; Senack, 2014a; Senack, 2014b). Inclusive access and equitable access models are starting to remove these barriers to course materials access for students. Increased access to course materials may contribute to increased student outcomes (Hurley & Fekrazad, 2020; Moore, 2021; Moore & Piazza, 2022; Spica, 2021; Williams et al., 2020). The purpose of this study was to understand if the use of an equitable access course materials model had any impact on the course completion rate of students enrolled in an equitable access program compared to students who had to source their own required course materials. Given the recent rise in equitable access programs throughout higher education, it is important to understand how these programs are impacting students beyond cost savings (Moore, 2022a).

Literature Review

At the time of this study, there was only one other study available on the use of an equitable access program and its impact on student outcomes (Moore, 2022b). Therefore, this brief literature review will focus on providing context and background on inclusive access and equitable access course material models and an overview of the single available study on equitable access and its impact on student outcomes. While this study's focus is equitable access, inclusive access is a very similar program and was the precursor to the development of equitable access course material models.

The terms inclusive access and equitable access were first coined by Jason Lorgan and his leadership team at the University of California, Davis (Moore, 2022d). Since their inception, these terms have been widely adopted across higher education and course materials. Inclusive access and equitable access course materials models can be described as course materials acquisition models that provide students with their required course materials on or before the first day of class. Students acquire their course materials through digital delivery via the campus learning management system or by picking up physical copies at the bookstore or having them shipped to a desired location (Conole et al., 2020; Curiel, 2021; Murphy & Shelley, 2020).

Inclusive and equitable access models, by design, do not require students to pay out of pocket, upfront costs for their materials. Students are charged a reduced cost or fee that is billed directly to their student account with the institution's Bursar office (Hurley & Hallmark, 2020; Jansen, 2022; Leonard, 2022, Polk Newsroom, 2022; Spica, 2021). This provides students with financial aid an opportunity to use it without having to wait for aid to be dispersed to the student (Anaya & Yankelewitz, 2020; Cuillier, 2018; Jansen 2022; Vitez, 2020). While inclusive and equitable access appear similar, there are important differences in the programs.

Inclusive Access

The best definition of inclusive access is that is a 'by course' course materials acquisition model where students enrolled in a course or sections of a course are provided their required course materials on or before the first day of class (Anderson, 2019; Moore, 2022b). However, inclusive access is a broad industry term and can be called different names by bookstore leasing companies, publishers, or institutions (Abaci & Quick, 2020; McClendon & McMillen, 2020; Vitez, 2020). Generally, faculty decide if they want to participate in inclusive access course materials models. Faculty participation is what drives the adoption of inclusive access across the campus.

The course materials content type in an inclusive access model is mostly digital and publisher content driven (McKenzie, 2017). Therefore, the cost of course materials in an inclusive access course materials model is negotiated between the institution, campus bookstores, and publishers (Cuillier, 2018). The cost savings students may experience with this course materials acquisition model can range from 30% to 80% off the cost of a physical textbook (ENMU-Ruidoso, 2023; OhioLink, 2022; UC Davis Stores, 2022a). The cost is dependent on the course materials being chosen by the instructor because it is on a ‘course by course’ basis. Participating in an inclusive access course materials model is not a requirement. Students who do not want to participate can opt-out, receive a refund, and revert to the ‘find and acquire’ model to attempt to secure their course materials on their own. (Alabama State, n.d.; Budnik & Schneider, 2022; DayOne Access, 2023).

Equitable Access

Equitable access can be considered the evolution of inclusive access. Where inclusive access is a ‘by course’ model, equitable access is a ‘whole campus’ course materials acquisition model where every student in every section of every course across the institution is provided with their required course materials on or before the first day of class. Similar to inclusive access, equitable access programs can be called by different names depending on the campus bookstore and institution.

The main differences between inclusive access and equitable access is who’s involved, available course materials content, associated costs, and how opting out of the program impacts students. In an equitable access model, every student across the entire campus has their course materials provided as part of the program on or before the first day of class. This distinction is important because faculty are not making an individual decision to participate and impacts students differently if they choose to opt out. Course material content types in an inclusive access model are mostly publisher-driven digital content whereas in an equitable access model, all course material content options are available. This includes the use of physical textbooks, digital textbooks,

courseware, textbook rental, and open educational resources (McKenzie, 2017; UC Davis Stores, 2022b). As a campus-wide model this is a critical component of equitable access models because faculty member academic freedom must be preserved. A program that restricts faculty from choosing course materials that meet their preference or pedagogical need will negatively impact students.

The last two differences between inclusive access and equitable access is cost and opt-out provisions. Equitable access program costs are still negotiated between institutions, campus bookstores, and publishers, but the cost is negotiated into a per credit hour fee or a single flat fee that is paid by every student regardless of major or program (Anderson, 2019; Budnik & Schneider, 2022; The California State University, 2023; UC Davis Stores, 2022b). A per credit hour fee is charged to students based on the number of credits they are taking for the semester. A current review of equitable access program costs suggests that per credit hour fees range anywhere from \$20 per credit hour to \$25 per credit hour and single flat fees range between \$169 and \$225 per term (Moore, 2022c). Finally, the impact of opting out of an equitable access program is different than opting out of an inclusive access program. When a student opts out of an inclusive access program, they are only opting out for that one class. However, when a student opts out of an equitable access program, they are opting out for all their courses. That means they will need to source their own required course materials for all the courses they are taking for that term.

Equitable Access Research

At the time of this study there was only one other available study on the use of an equitable access program and its impact on student outcomes. Moore (2022b). This study examined the course completion rates of participants and non-participants of an equitable access course materials model at two two-year institutions. For the study, non-participants were those students who voluntarily opted out of the equitable access program on their campus. The study had a total of 23,415 students

with a 23% opt out rate. The study defined course completion as a student earning a letter grade between A and D.

This study found all demographic categories to have a statistically significant difference in course completion rate in the participant population when compared to the non-participant population. All categories analyzed experienced a double digit increase in course completion rate for the participant population apart from students age ≥ 25 (+6.01%) and the race/ethnicity category of Other (+9.02%). The main takeaway from the study was that non-participants of the equitable access program had a course completion rate 15.58% lower than participants.

Purpose and Research Question

The purpose of this study was to examine the impact on student course completion rates when four-year university students are provided their required course materials on or before the first day of class as part of an equitable access program, compared to students who had the responsibility to source their own required course materials. This study sought to provide evidence of an increase in the number and percentage of students who completed a course with a letter grade D or better as part of an equitable access course materials model. Course completion rate for this study was defined as a student earning a letter grade between A and D. Previous research on equitable access and course completion rate utilized the same grade variance (Moore, 2022b). To achieve this insight, this study sought to answer the central research question:

1. When comparing students enrolled in an equitable access program and students who had to source their own required course materials, is there a statistically significant difference in the number of students who completed a course with a letter grade D or better?

Method

Study Design

The University of Southern Mississippi (USM) responded to a direct email inquiry to participate in research examining the impact of their equitable access course materials model on student outcomes. USM provided data from the pre-equitable access terms for Fall 2020 and Spring 2021 as well as data from the post-equitable access implementation terms of Fall 2021, Spring 2022, and Fall 2022. This study used the course completion rate metric guidelines provided by Moore (2022b) in their study on the impact of an equitable access program at two two-year institutions on course completion rates between participants and non-participants of an equitable access course materials program.

Participants

The total population for this study was N=48,967; n=21,735 were in the pre-equitable access implementation population and n=27,232 were in the post-equitable access implementation population. The study population leaned heavily female (63%) and age ≤ 24 (89%). White students made up nearly 56% of the total study population while Black students made up around 32%. Table 1 provides a breakdown of participants into two groups: Before Equitable Access and After Equitable Access.

Table 1. Participants Characteristics

Characteristics	Before EA		After EA	
Gender				
Male	8072	37.14%	9869	36.24%
Female	13663	62.86%	17363	63.76%
Total	21735		27232	
Race/Ethnicity				
White	12185	56.06%	15223	55.90%
Black	7295	33.56%	8801	32.32%
Hispanic	973	4.48%	1240	4.55%
Asian	412	1.90%	586	2.15%
Native American	98	0.45%	134	0.49%
2± Races	772	3.55%	1248	4.58%
Total	21735		27232	
Student Age				

Age ≤ 24	19362	89.08%	24452	89.79%
Age ≥ 25	2373	10.92%	2780	10.21%
Total	21735		27232	
Pell Grant Status				
Yes	10953	50.39%	11510	42.27%
No	10782	49.61%	15722	57.73%
Total	21735		27232	

Data Collection

Data used for this study were historical and already collected and stored in the institutional student information system. Data requested and received was deidentified by the University of Southern Mississippi. Student identification numbers and age were masked or randomized before being received by the researcher. Researcher applied for and received IRB approval from UNH and the participating institution. This study used no human subjects and was exempt from IRB.

Data Analysis

Analysis for this study utilized multiple 2x2 chi-square tests of independence with one degree of freedom to understand if there were statistically significant differences in course completion rates between the pre and post equitable access implementation populations. Studies examining the impact of course materials intervention models like equitable access have previously used chi-square tests of independence to examine statistically significant relationships between pre and post implementation populations (Fischer, et al., 2015; Moore, 2021, Moore, 2022b; Moore & Piazza, 2022). This study utilized a p-value of .05 for analysis.

Results

The purpose of this study was to examine the impact of an equitable access course materials model on student course completion rates. A total of 48,967 students were included in the study. Of the total population, 21,735 were in the pre-equitable access implementation population and 27,232 were in the post-equitable access implementation population. For this study, course completion rate was defined as a student earning a letter grade between A and D.

Grade Distribution

Table 2 provides the results of the grade distribution between the pre and post equitable access populations. Grade distribution was not central to the study, but similar studies on course materials intervention research has provided it and observers may find it useful (Moore, 2021, Moore 2022b; Moore & Piazza, 2022).

Table 2. Grade Distribution and Course Withdrawal

Grade	Before EA		After EA		Percent Change
	<i>n</i>	%	<i>n</i>	%	
A	8201	37.73%	10906	40.05%	2.32%
B	5514	25.37%	6821	25.05%	-0.32%
C	3178	14.62%	3760	13.81%	-0.81%
D	1296	5.96%	1569	5.76%	-0.20%
F	2262	10.41%	2696	9.90%	-0.51%
W/I	1284	5.91%	1480	5.43%	-0.47%

The post-equitable access implementation population experienced a 2.32% increase in grade letter A while all other letter grades experienced a decrease from the pre-equitable access implementation population. Unlike previous course materials intervention research, this study did not find an impactful reduction in withdrawal or incompletes in the post-equitable access population (Moore, 2021; Moore, 2022b; Moore & Piazza, 2022).

Central Research Question

To answer the central research question of when comparing students enrolled in an equitable access program and students who had to source their own required course materials, is there a statistically significant difference in the number of students who completed a course with a letter grade D or better, a 2x2 chi-square test of independence as performed to compare the total number of students in the pre-equitable access population who completed a course and the total number of students in the post-equitable access population who completed a course. Subsequent 2x2 chi-square tests of independence were performed for each category of student demographic. Table 3 shows the results

of the chi-square tests along with the course completion rate in the before and after equitable access populations in their corresponding demographic category.

Table 3. Course Completion Rate by Category

Category	Before EA CC Rate	After EA CC Rate	Percent Change	Course Completion χ^2	Significant at $p < .05$
Total Population	83.69%	84.67%	0.98%	$p = .003$	Yes
Pell Grant Students	81.20%	82.87%	1.67%	$p = .001$	Yes
Male	80.40%	82.22%	1.82%	$p = .001$	Yes
Female	85.66%	86.06%	0.40%	$p = .322$	No
White Students	86.78%	87.20%	0.42%	$p = .306$	No
Black Students	78.09%	79.84%	1.75%	$p = .007$	Yes
Hispanic Students	86.74%	85.08%	-1.66%	$p = .266$	No
Asian Students	89.08%	91.64%	2.56%	$p = .173$	No
Native American	66.33%	82.84%	16.51%	$p = .004$	Yes
2± Races	83.16%	84.29%	1.13%	$p = .501$	No
Age ≤ 24	83.88%	84.68%	0.80%	$p = .022$	Yes
Age ≥ 25	82.09%	84.53%	2.44%	$p = .019$	Yes

Category Results

Within the 12 categories analyzed, seven were found to have statistically significant differences in the number and percentage of students who completed a course while five were found to have no statistically significant differences. In the total population of the study, the After EA population experienced a 0.98% increase in course completion rate compared to the Before EA population. This was statistically significant ($\chi^2 (1, N=48967) = 8.74, p < .05$). Similarly, Pell grant students

(+1.67%) in the After EA population experienced an increase in course completion rate over the Before EA Pell grant students and that was statistically significant ($\chi^2(1, N=24842) = 11.64, p < .05$).

On gender, both Male (+1.82%) and Female (+0.40%) students in the After EA population experienced an increase in course completion rate. However, male student results were statistically significant ($\chi^2(1, N=17941) = 10.33, p < .05$) and female student results were not ($\chi^2(1, N=31026) = 0.98, p > .05$).

With respect to race, all race/ethnicity categories experienced an increase in course completion rate except Hispanic students ($\chi^2(1, N=2213) = 1.24, p > .05$) who had a negative interaction and experienced a decrease in course completion rate in the After EA population compared to the Before EA population. Despite the increase in course completion rate for White (+0.42), Black (+1.75), Asian (+2.56), Native American (+16.51), and 2 or More Races (+1.13) students, not all categories had statistically significant results. White students ($\chi^2(1, N=27408) = 1.05, p > .05$), Asian students ($\chi^2(1, N=998) = 1.86, p > .05$), and students of 2 or More Races ($\chi^2(1, N=2020) = 0.45, p > .05$) they were not statically significant. The impact of equitable access on course completion rates for Black students ($\chi^2(1, N=16096) = 7.36, p < .05$) and Native American students ($\chi^2(1, N=232) = 8.43, p < .05$) were statistically significant.

Both age demographics experienced increases in course completion rates in the After EA populations compared to the Before EA populations. Traditional aged students, those aged 24 and younger, experienced an increase in course completion rate of 0.80% while Non-Traditional aged students, those aged 25 and older, experienced an increase in course completion rate of 2.44%. Similarly, both Age ≤ 24 ($\chi^2(1, N=43814) = 5.22, p < .05$) and Age ≥ 25 ($\chi^2(1, N=5153) = 5.52, p < .05$) were statistically significant.

Post hoc testing was not conducted on the chi-square test of independence p-values because they were 2x2 chi-squares with one degree of freedom which do not require post hoc testing.

Generally, only chi-square tests greater than 2x2 (i.e., 2x3) require post hoc testing (McDonald, 2014).

Discussion and Implications

This study sought to provide evidence of an increase in the number and percentage of students who completed a course with a letter grade D or better as part of an equitable access course materials model. Course completion rate for this study was defined as a student earning a letter grade between A and D. Previous research on equitable access and course completion rate utilized the same grade variance (Moore, 2022). Results of the chi-square tests of independence revealed statistically significant results for 7 of the 12 categories analyzed.

Race/Ethnicity

While all analyzed categories except one (Hispanic -1.66%) experienced an increase in course completion rate post equitable access implementation, the results were not as visually impactful as the previous study on course completion rates and equitable access (Moore, 2022b). However, the key finding of this study was that underrepresented student populations experienced a 2.5x-40x greater benefit with equitable access than their White majority peers. White students made up 56% of the post implementation population. Black students, who made up 32% of the post implementation population, experienced an increase in course completion rate nearly 4.5 times that of White students. This is true for Asian students, nearly 6 times greater, and students who identify as 2 or More Races, nearly 2.5 times greater. Native American students made up less than a half percent (0.49%) of the post implementation population but experienced a benefit 40 times greater than their White peers.

These results are in line with previous discussions on course materials interventions and their impact on underrepresented student populations (Moore, 2021; Moore & Piazza, 2022; Moore 2022b). This study did not seek to understand student perceptions, so it is difficult to definitively say

why underrepresented student populations are experience a greater benefit than their White majority peers, but Moore (2022b) suggested that there could be elements of social justice and cultural capital at play.

Practical Significant

There remains a debate about the practical significance versus statistical significance of studies like this. As with all research, but more importantly for this purpose, course materials intervention research, researchers look to achieve greater statistical significance to prove that an intervention is not merely luck. However, within these analyses there is real world, practical significance that we can easily overlook in our quest to prove the statistical significance of an intervention. Studies on inclusive and equitable access have shown statistical significance in all categories examined (Hurley & Fekrazad, 2020; Moore, 2022b; Williams et al., 2020) while others have shown mixed results in the categories studied (Moore, 2021; Moore & Pizza, 2022).

As Moore & Piazza (2022) suggested, it is incumbent upon practitioners – administrators and faculty – to look beyond the statistical significance to see how adoption of these course materials intervention models can help students be more successful and stay on track during their academic journey and degree attainment. Course materials intervention research isn't rocket science, but course materials intervention adoption could help someone become a rocket scientist.

Limitations

This study has limitations that need mentioning outside the possibilities of data errors during extraction, formatting, and reporting. This study was conducted at a single institution which limits the ability to correlate to other institutions and equitable access course materials models. Further, the study did not take into consideration course modality (online, in-person, hybrid), instructor changes, changes in assessment, or course assignment/quiz weight, or the course materials content types used in the pre or post implementation environments. The study did not explore how course

materials were used by instructors or measure student engagement in the course materials. There was no attempt made to understand student perceptions of the equitable access course materials model. This study did not review or attempt to factor a student's overall GPA in the analysis. There was no attempt made to collect or consider how external forces impacted a student's ability to complete assignments, study, or attend class. A review or analysis of the cost of course materials before or after equitable access was implemented was not conducted. This study utilized a 2x2 chi-square test of independence and it is possible the use of another analysis tool may provide alternative perspectives or results of the impact equitable access may have on student outcomes

Future Research

This study sought to contribute to the literature on how equitable access course materials models impact student course completion rate. There remains a considerable void in the literature on the use of equitable access models and their impact on student outcomes. Only one previous study (Moore, 2022) exists that examines how equitable access can impact students beyond cost savings.

Despite this study's best effort to understand if providing access to course materials through an equitable access program can support students being more successful in the classroom, there is more work necessary to understand these types of revolutionary course materials acquisitions models. This study took a very broad overview of equitable access. There are two areas where future research can enhance our understanding of these models.

Content Type

One of the main advantages of an equitable access model is the ability to use all available course materials content types. This includes traditional physical textbooks, digital textbooks, courseware, rental textbooks, and open educational resources. A more granular focus on specific content type options might demonstrate how one is more suited to helping students be successful in the

classroom. Content type research may prove important given the interactive nature of courseware or the low-cost nature of open educational resources.

Mixed Methods

This study and similar research (Hurley & Fekrazad, 2020; Moore, 2022; Moore & Piazza, 2022; Spica, 2021) have only considered the quantitative nature of how course materials interventions like inclusive access and equitable access impact student performance. A consideration for future research is to complete a mix methods study that examines data on student outcomes while also capturing student perceptions of the course materials intervention model being used on campus. This type of study would allow for further investigation on how certain demographics are impacted with outcome data and the student voice attached to that outcome data.

Other Course Materials Options

While the focus of this study was on the impact of equitable access on student course completion rates, it is important to note that equitable access is not the only program attempting to reduce costs of and increase access to course materials for students. Other course materials models being used in higher education in the United States include open educational resources, textbook rental, and e-text rental programs (Hilton, 2016; Hurley & Carter, 2020; Medley-Rath, 2018; University Bookstore, 2022).

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