Tuition Equity: A study of the disparate impact of different forms of block tuition based on race

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Abstract

This full empirical research paper explores the impact of block tuition across different demographics. While much attention has been paid to college accessibility, particularly regarding elite school admissions and overall affordability, less focus has been given to how institutional policies—such as tuition and fee structures—affect different degrees and students disproportionately. These structures not only make certain degree programs more expensive but can also effectively impose varying tuition rates on students pursuing the same degree. This issue is especially pronounced in engineering programs and can counteract financial aid efforts aimed at supporting underrepresented or disadvantaged students.

Motivated by the United Nations' Sustainable Development Goal 4 (SDG-4) on equitable education, this research adopts the equity measurement framework outlined in the Handbook on Measuring Equity in Education. We use the impartiality measures proposed in the handbook to assess the fairness of block tuition systems across racial groups.

Our central research question asks: *How equitable is the impact of block tuition structures for students of different races?* Block tuition refers to the practice of charging a flat rate for a range of credit hours, but this policy is implemented differently across institutions. For example, at Grand Valley State University, students pay a flat rate for enrolling in 12 to 15 credits, which equals the cost of 12 credits, effectively giving those who enroll in more than 12 credits a discount. Conversely, at Michigan State University students are charged a flat rate for 12 to 18 credits, based on the cost of 15 credits. This setup results in students enrolled in fewer than 15 credits paying more per credit, while those taking more than 15 credits pay less.

These policies offer discounts that are not accessible to all students, disproportionately impacting those who cannot enroll in 15 or more credits due to time constraints, financial limitations, or course availability issues. Engineering programs, in particular, are affected by this inequity because they tend to require more credits than other programs, offer limited flexibility in elective choices, and have stringent prerequisite structures. As a result, engineering students often miss out on block tuition discounts, are forced to take extra, non-essential courses to reach the minimum credit load to realize a discount or need more semesters to complete their degrees—leading to higher overall costs.

This research examines student data from the two universities to compare the effective block tuition discounts and the number of credits earned at graduation based on race for both engineering and non-engineering degrees. The analysis centers on the average discount or premium per credit hour resulting from different block tuition policies. Using this as the basis of an impartiality measure, we find that these tuition structures disproportionately benefit certain groups, providing financial advantages to some demographics over others.

Introduction

In the United States, inequities in the funding, support, and outcomes of K-12 education and equality of access to higher education receive significant attention. The media, policy makers, and academic literature often focus on the convoluted and secretive admissions process at elite schools and overall college affordability [1-3]. Advocates also highlight the potential impact of seemingly neutral policies, such as requiring remedial courses and limiting credit transfers from associate degree programs, on structural racism in higher education [4]. However, there has been less study of policies regarding tuition and fees outside of the impact of focused financial aid and assistance, with the exception of a recent study that explored how tuition and fee systems in different countries support or inhibit participation of low-income students [5].

There remains a significant research gap on the economic and behavioral impacts of block tuition that will require a larger study with a wide range of institutions with broad demographic representation. This tuition structure makes various college degrees more expensive and involve charging different tuition rates to students earning the same degree. This can have a significant impact on engineering students and counter efforts to provide targeted financial aid support. This paper expands upon preliminary work done at our home institution, Grand Valley State University (GVSU), by gathering and analyzing data from bachelor's degree recipients who attended Michigan State University. Our two local (GVSU) studies explored the equity of the upper- / lower-division tuition structure, which is popular in the State of Michigan [6], and block tuition, which is popular throughout the United States [7]. As with those studies, this work is based on the United Nations Sustainable Development Goals (SDG-4) for equity in education and utilizes the methods and framework for equity described in the *Handbook on Measuring Equity in Education* [8]. The handbook identifies five categories of impartiality measures to gauge equity in learning: (a) the gap or difference in selected values between groups; (b) the ratio of representation in learning to the general population; (c)the covariance or correlation between membership in a group and some outcome; (d) the concentration index comparing strata of the population to educational outcomes; and (e) comparisons of group-level cumulative information. UNESCO posits that the most equitable outcome would be one in which all identifiable groups are indistinguishable in their educational hurdles and outcomes. This paper's analysis is based on the difference in the average tuition paid per credit hour among the identified groups. It highlights the unequal effects of the tuition structure, demonstrating how variations in the student population and group membership are linked to differing financial outcomes (charges).

Our central research question asks: *How equitable is the financial impact of the block tuition structure for students of different races?* Secondarily, we would like to know if different rate structures have a different effect on student enrollment (number of credit hours taken per semester). In the context of this study, an equitable financial impact would be demonstrated by an equal average tuition charge per credit hour regardless of demographic group. Block tuition (also known as flat-rate tuition) is the practice of charging a flat rate for a range of credit hours. For example, at Grand Valley State University students pay a flat rate for enrolling in 12 to 15 credits, which equals the cost of 12 credits, effectively giving those who enroll in more than 12 credits a discount. Conversely, at Michigan State University, students are charged a flat rate for 12 to 18 credits, based on the cost of 15 credits. This latter setup results in students enrolled in fewer than 15 credits paying more per credit, while those taking more than 15 credits pay less relative to the published per credit rate.

Given that this study explores the financial impact of a policy based on race, it is important to note that there are legal guidelines regarding what is acceptable based on Title VI and Title VII of the Civil Rights Act. In 1971, the U.S. Supreme Court ruled in *Grigg v. Duke Power Company* [9] (as modified [10]) that impediments to employment and advancement are illegal for most private companies if they have a disparate impact upon Title VII protected classes (race, color, sex, and national origin) [11]. Title VI of the 1964 Civil Rights Act imposes similar requirements upon all organizations that receive federal funds [12]. The U.S. Department of Justice uses the following three-part test to determine if an organization receiving federal funds has violated Title VI [13]:

1. **Disparate impact:** Does the adverse effect of the policy or practice fall disproportionately on a race, color, or national origin group? …
2. **Justification:** If so, does the record establish a substantial legitimate justification for the policy or practice? …
3. **Less discriminatory alternative:** Is there an alternative that would achieve the same legitimate objective but with less of a discriminatory effect? …

This study explores the first and second question of the three-part test and discusses possible alternatives, which could be explored to answer the third question.

Additionally, the identification of structural impediments on the basis of race, class, or sex is permitted by new rulings and regulations even while explicit preferences are rapidly becoming illegal in the current US political environment. For instance, addressing systemic barriers to entry such as tuition structure would be an example of how "to continue to enroll racially diverse classes by race-neutral means" [14]. Recent presidential executive orders prohibit "balancing based on race, color, sex, sexual preference, religion, or national origin," or the use of "'diversity,' 'equity,' 'equitable decision-making,' 'equitable deployment of financial and technical assistance,' 'advancing equity,' and like mandates," for government and government contractors [15]. Given these prohibitions, the work is focused on the effects of general policies that may inadvertently discriminate, and the modification of these policies is generally encouraged and not controversial. This work explores the questions of the three-part disparate impact test as they relate to financial impacts. Any alternative policy prescriptions resulting from this study to balance the impacts on different groups would likely be considered "race-neutral" by current law.

Table 1 summarizes the 2023-24 tuition rates for public universities in the State of Michigan [16]. As of the 2023-24 academic year, 11 of 15 public universities employed a form of block tuition, but they are not all the same. Figure 1 illustrates the tuition charges at the two universities included in this study, which implemented block tuition differently. Michigan State University has a flat tuition for 12-18 credit hours, but the charge for students enrolled in that range is equivalent to 15 times the per credit rate. This results in students in the 12-14 credit hour range being charged a premium relative to the per credit rate, and this is harshest for students who enroll in 12 credits as there is a steep difference in tuition charged when enrolled in 12 vs. 11 credits. Only students enrolled in more than 15 credits would see a discount in this structure. Grand Valley State University on the other hand has a flat tuition for 12-15 credits and the charge is equivalent to 12 times the per credit rate. This effectively gives any student who enrolls in more than 12 credits a discount. This is similar to a BOGO (buy-one get-one) promotion and can be characterized as *buy 12 credits and get up to 3 free*.

Table 1: Comparison of Tuition (per Credit Hour) and Block Tuition Rates for Public Michigan Universities in 2023-24 [16]

	Tuition per Credit	***Block Tuition***	***Block Credit Range***		***% Difference***	
	< min	***In range***	***min***	***max***	***@min***	***@max***
Central Michigan University	$458.00	-	-	-	0.0%	0.0%
Eastern Michigan University	$637.35	$7,600.00	12	16	0.6%	25.5%
Ferris State University	$483.00	-	-	-	0.0%	0.0%
Grand Valley State University	$614.00	$7,314.00	12	15	0.7%	20.6%
Lake Superior State University	$582.00	$6,984.00	12	16	0.0%	25.0%
Michigan State University	$521.75	$7,824.00	12	18	-25.0%	16.7%
Michigan Technological University	$682.00	$9,037.00	12	18	-10.4%	26.4%
Northern Michigan University	$517.00	$6,204.00	12	16	0.0%	25.0%
Oakland University	$507.50	-	-	-	0.0%	0.0%
Saginaw Valley State University	$408.00	-	-	-	0.0%	0.0%
University of Michigan	$671.00*	$8,448.00	12	18	0.0%	32.3%
University of Michigan-Dearborn	$606.00	$7,272.00**	12	UNL	0.0%	N/A
University of Michigan-Flint	$536.00	$6,432.00	12	UNL	0.0%	N/A
Wayne State University	$519.46	$6,246.49	12	18	-0.2%	33.2%
Western Michigan University	$603.92	$7,247.00	12	15	0.0%	20.0%
***First credit hour is $1,066.**	****$117 per credit over 12**		**UNL = Unlimited (no published cap)**			

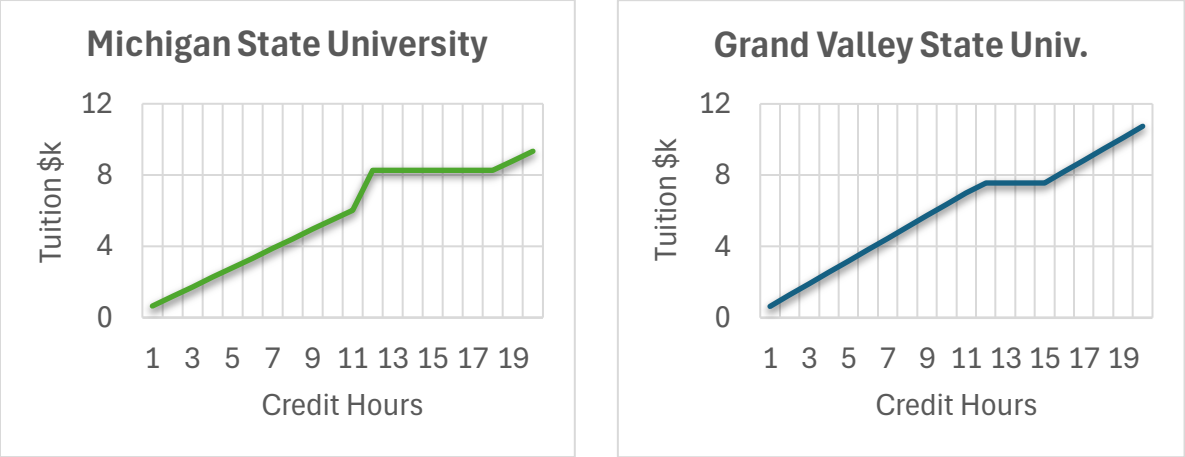

Figure 1: Tuition charges vs. number of credits for two universities. Michigan State University has a block rate from 12-18 credits with the block charge being equal to 15 times the per credit rate. Grand Valley State University has a block rate from 12-15 credits with the block charge being equal to 12 times the per credit rate.

The popularity of block tuition structures continues to grow, but universities employing it have to increase the per credit rate to ensure they do not reduce revenue. In 2023, Wayne State University began using block tuition in an effort to encourage a better time to graduation [17]. Eastern

Michigan University made a similar change to block tuition in 2021 [18] [19]. In both cases, the per credit hour rate was increased substantially to ensure that the discount represented by the block tuition structure would not result in a loss in revenue. Wayne State University increased their rate from $431 to $519 (20.4% more), and Eastern Michigan University increased their rate from $450 to $580 (28.9% more). These increases ensure that only a small number of students who are able to enroll in more than the average number of credit hours would financially benefit from the change in policy, and those who are below the average will pay more by placing a financial incentive on enrolling in more credit hours. While most students are able to maintain full-time enrollment, there are students who are enrolled part-time for a variety of academic and personal reasons. A study has found that there is a measurable impact of block tuition on the number of credits taken and four-year graduation rates; however, the study also found an increase in the number of course withdrawals and did not include information on five- or six-year rates, a demographic breakdown, or any analysis on the programs' equitability. [20].

It is important that the financial impacts of these policies are studied, given that the economic and personal impacts of student debt is a problem that continues to grow [21] and debt forgiveness and reform are politically difficult to achieve [22]. The negative effects of student debt also tend to fall disproportionately on marginalized groups [23]. For instance, federal Pell Grants are awarded solely based on financial need and can typically be used to pay only a fraction of total tuition as the maximum Pell Grant award for 2024-25 remains fixed at $7,395, the same as the previous year [24]. Because the cost of attendance typically exceeds the level of support a student receives, changes in fees or tuition structure affect Pell Grant recipients on a dollar-for-dollar basis, thus leaving them with more debt than their peers on average [25]. Recipients of Pell Grant strongly correlate to marginalized identities and tend to have the highest default rates on student loans [26].

Student data from Michigan State University and Grand Valley State University were examined to compare both the effective amount of block tuition discount (measured as a percentage of the per-credit rate) and the number of credits earned by graduation for different groups of students who graduated with a 4-year degree. Numerous other public institutions in Michigan were invited to join the study; however, they either declined or imposed data restrictions that would affect the analysis. Impartiality measures are presented based on race/ethnicity for both engineering degreed graduates and all other majors. The goal of this analysis is to determine if the block tuition structure has a disparate financial impact on the different groups, providing a financial advantage to some demographics over others.

As indicated in [7], we hypothesize that engineering degree programs tend to be charged more on average relative to non-engineering programs for three reasons:

1. First, engineering programs require more credits (typically 5-25 more semester credits) than other programs [27].
2. They have less flexibility and few if any free electives that allow earned credits outside of their specific degree requirements to be used.
3. The strict prerequisite requirements further limit flexibility in scheduling courses.

The result is that most engineering students either take fewer than the optimal number of credits per semester to maximize the block tuition discount (or minimize the premium) or take additional courses that do not contribute to degree requirements to claim the discount. To investigate this hypothesis, we performed the analysis both with all students and with engineering students

exclusively. As a result, we will measure how equitable the financial impacts of the block tuition structure are for engineering students of different races relative to their non-engineering peers.

Methods

This paper investigates whether the block tuition structure fails to provide an equal benefit to students from marginalized (historically under-resourced) communities. This was done by taking student data from Michigan State University (MSU) and Grand Valley State University (GVSU), which included the following information for each student:

- Self-reported race/ethnicity
- Number of transfer credits
- Number of AP/CBE (Credit-by-Examination) Credits
- Number of changes to degree program
- Number of credits attempted at MSU/GVSU
    - Separated by level (000, 100, 200, 300, & 400 level)
- Number of credits earned at MSU/GVSU
    - Separated by level (000, 100, 200, 300, & 400 level)
- Total credits at graduation
    - Separated by level (000, 100, 200, 300, & 400 level)
- Number of credits attempted at MSU/GVSU by semester
    - Credit hours separated by semester

The dataset used for this analysis contained data on 44,483 students from Grand Valley State University and 91,639 from Michigan State University who completed a bachelor's degree with a minimum of 120 semester credits, which was voluntarily provided by each institution. To isolate the effects of this tuition structure, this analysis utilized the attempted hours by semester data and applied only the current tuition rate (per credit and block rate) for the 2023-24 academic year regardless of the time of enrollment. By applying the same tuition rates to all students from different cohorts, we could simplify the analysis and eliminate the need to correct for inflation, time-value of money, and changing tuition rates. While the tuition rates of both universities changed over time due to regular increases, their structure remained the same minimizing the risk of a bias in the comparison. Additionally, our analysis omitted additional charges for particular majors as well as other fees to allow for the isolation of the financial impact of block tuition.

The goal of the analysis was the exploration of disparate financial impacts of the block tuition structure on different races/ethnicities. For each student, all transfer, AP, and credit-by-examination credits were assumed to not impact their enrollment or billing. The history of attempted credits per semester was used to calculate the tuition for each term using the current tuition structure at MSU and GVSU. The average of the effective discount (or premium) percentage was calculated for different groups for comparison, which include:

- White
- African American or Black
- Asian
- Hispanic or Latino
- Non-resident International

- American Indian or Alaskan Native
- Native Hawaiian or Other Pacific Islander
- Two or more races
- Not reported

This analysis was repeated with data exclusively for engineering students for comparison and presented with as a percentage difference relative to the average tuition paid per credit hour attempted.

Results

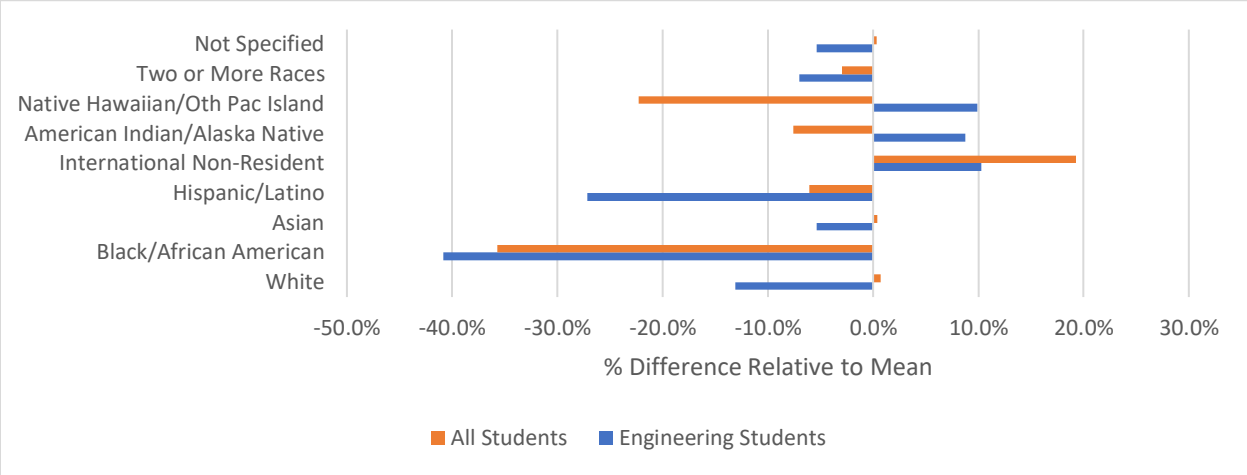

Figure 2: Comparison of effect (% difference) relative to the mean for all students as a result of block tuition at Michigan State University. Negative values indicate students were charged more than the average per credit attempted.

The average effective block tuition discount (or premium) per credit hour is the impartiality measure used for this analysis. A policy with no disparate impact would result in equal values for the impartiality measure for all demographics studied. As can be seen in Table 2, this measure is not equal among the demographics and is worse for engineering students at MSU.

Table 2: Average effective per credit discount or (premium) resulting from block tuition based on race/ethnicity for engineering students and all students at Michigan State University.

	Engineering Students		All Students	
Race/Ethnicity	***Discount/ (Premium)***	***N***	***Discount/ (Premium)***	***N***
White	$ (36.09)	4,326	$ (31.69)	65,112
Black/African American	$ (44.94)	174	$ (43.30)	5,384
Asian	$ (33.61)	404	$ (31.78)	4,743
Hispanic/Latino	$ (40.59)	179	$ (33.85)	3,645
International Non-Resident	$ (28.63)	867	$ (25.75)	9,189
American Indian/Alaska Native	$ (29.11)	10	$ (34.34)	175
Native Hawaiian/Other Pacific Islander	$ (28.74)	4	$ (39.01)	62
Two or More Races	$ (34.15)	135	$ (32.86)	2,496
Not Specified	$ (33.62)	59	$ (31.81)	833
All	$ (35.17)	6,158	$ (31.91)	91,639

On average, the block tuition structure at MSU charges a premium for all students regardless of demographic. The average premium is $31.91 per credit for all students and $35.17 per credit for engineering students. Figure 2 shows the percent difference of the average premium charged to students at Michigan State University. International non-resident students stand out among all students including engineering students as being charged less of a premium as a result of block tuition. This is logical as they are subject to minimum credit loads, but they are also required to pay higher non-resident tuition, which is not captured in this analysis. We also find that the average White and Asian students tend to be charged less than the average. On the other hand, Black and African American students along with Hispanic and Latino students tend to be charged more than the mean by a significant amount.

Table 3: Average effective per credit discount or (premium) resulting from block tuition based on race/ethnicity for engineering students and all students at Grand Valley State University.

	Engineering Students		All Students	
Race/Ethnicity	***Discount/ (Premium)***	***N***	***Discount/ (Premium)***	***N***
White	$ 58.30	1,057	$ 78.31	37,423
Black/African American	$ 56.96	13	$ 71.18	1,756
Asian	$ 50.19	24	$ 73.38	981
Hispanic/Latino	$ 54.51	33	$ 72.49	2,209
International Non-Resident	$ 55.90	29	$ 82.85	407
American Indian/Alaska Native	$ 52.88	4	$ 62.30	138
Native Hawaiian/Other Pacific Islander	-	0	$ 70.78	22
Two or More Races	$ 54.40	15	$ 75.22	1,358
Not Specified	$ 45.07	11	$ 64.89	189
All	$ 57.76	1,186	$ 77.47	44,483

The results of the analysis of student data from GVSU are shown in Table 3 and Figure 3. The results show that all students received a discount on average ($77.31) relative to the published per credit hour rate. On average, White and non-resident international students paid the less than the average student while all other demographics paid more than the average as they received less of a discount.

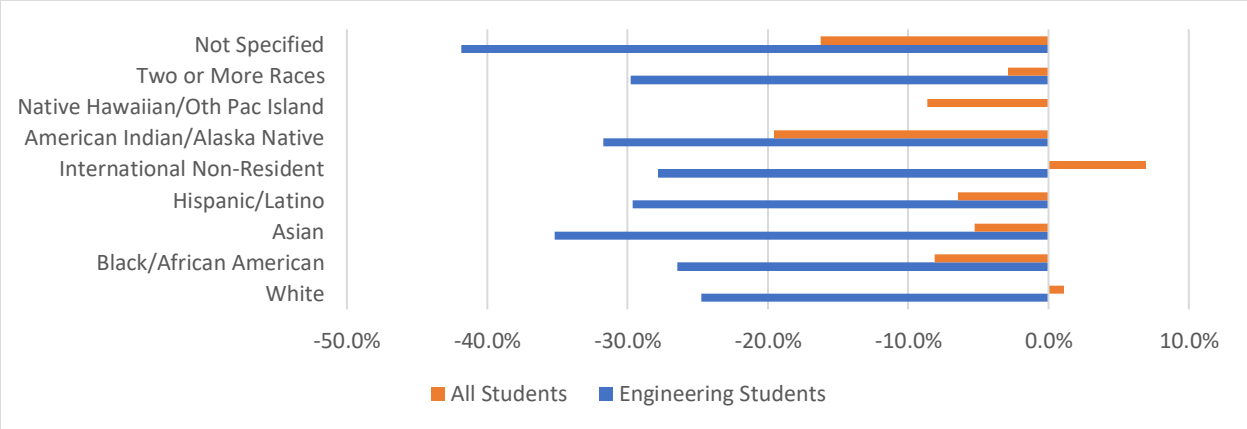

Figure 3: Comparison of effect (% difference) relative to the mean for all students as a result of block tuition at Grand Valley State University. Negative values indicate students were charged more than the average per credit attempted.

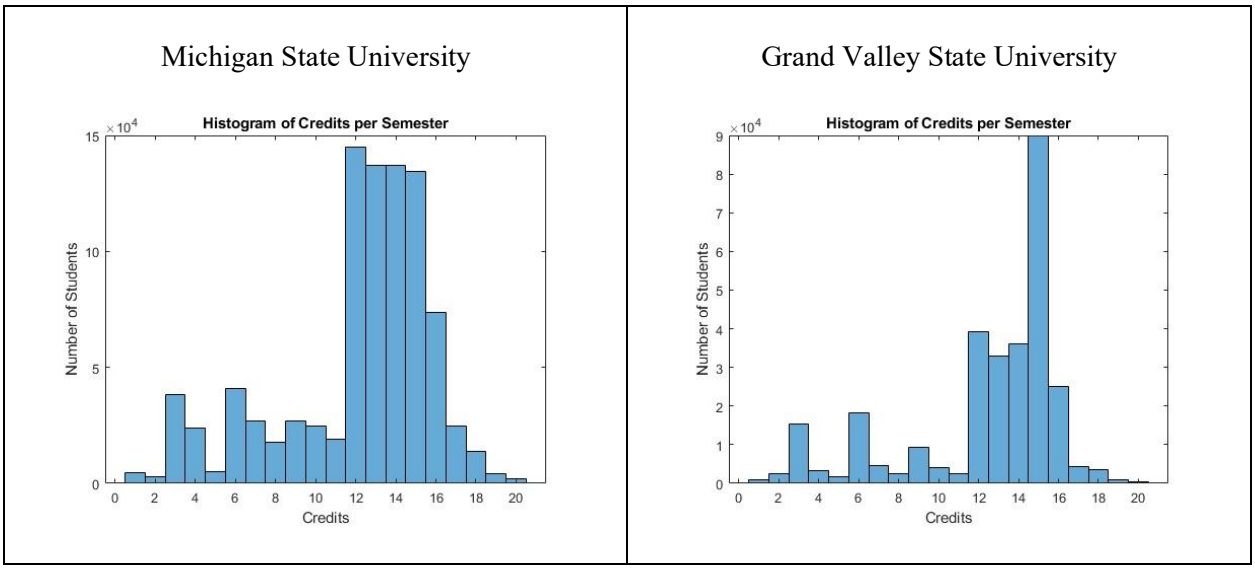

Figure 4: Histograms of credits attempted per semester by students at Michigan State University and Grand Valley State University.

Figure 4 shows the histograms of the number of credits attempted each semester by students at the two universities. There is a significant difference between the two universities. Enrollment at Michigan State University has a mean of 12.13 and a median of 13 credits per semester. Their enrollment suggests that their structure is less discouraging to part-time enrollment. This makes sense given that it charges nearly the same tuition per credit for someone enrolled in 6-11 credits as it does for a student enrolled in 15 credits. In comparison, Grand Valley State University has a mean and median of 12.46 and 14 credits per semester respectively, which is higher than MSU. This is the result of their charging less to students enrolled in 12-15 credits with the maximum discount at 15 credits. This structure appears to have the desired effect with less part-time enrollment with more students enrolling in 15 credits than any other amount.

Discussion and Conclusions

This paper presented a study of the financial effects of the block tuition structure on students based on race/ethnicity. This analysis utilized dispersion metrics as defined by the framework laid out in [8]. The results show that this tuition structure causes disproportionate financial impacts relative to a student race/ethnicity. There is also a clear disparate impact on engineering students, amplifying the issue for some marginalized groups.

The argument for utilizing a block tuition structure is to encourage students to enroll in more credits to reduce the time to graduation. A prior study has indicated that this is effective, the same study also found that the majority of students did not benefit financially by the policy [20]. The results from Michigan State University back the financial findings of this prior study. When the block tuition is structured to only provide a discount for students enrolled 12-15 credits as at GVSU, part-time enrollment is effectively discouraged and students will tend to enroll in the number of credits that minimizes their effective tuition per credit attempted, which was 15 credits in this case. The results from MSU's data indicate a less significant benefit. Students took fewer credits on average each semester, and financial concerns discouraged enrollment in 12-14 credit hours. Consequently, there was more part-time student enrollment.

Universities that are switching to block tuition are aware of the financial impact of the structure on the average student as they pair the adoption of block tuition with a change in the per credit hour rate. Both structures encourage enrollment in more credits, but they occur at different credit levels. MSU is discounted above 15 credits and GVSU is discounted above 12 credits. MSU charges a premium for all students enrolled in 12-14 credits, which is the majority of their student enrollment, and as a result, students are discouraged from enrolling in that range.

Looking at the three-part test laid out by the U.S. Department of Justice for Title VI [13], this analysis shows that this policy has a measurable *disparate impact* on students based on race/ethnicity. The *justification* for this policy is to encourage higher credit loads and improve graduation rates, but achieving the desired effect depends on the structure of the block tuition. Unfortunately, this analysis has shown this popular policy to be measurably discriminatory, and consequently less effective structures will be difficult to defend. Additionally, a viable alternative could also make it legally difficult to defend.

The study presented here reveals that the benefits of block tuition models at both universities are not evenly distributed, disproportionately affecting students from marginalized communities. These inequalities are often intertwined with other barriers and inefficiencies that are particularly prevalent among engineering students. For instance, students who are not placed in calculus or higher-level math courses are required to take additional math courses that do not contribute to their degree. Consequently, they are delayed in starting engineering courses that require math and physics prerequisites, leading to the completion of all general education requirements before they can take those courses alongside upper-division engineering courses. Another barrier relates to the efficiency of transfer credits. Depending on the agreements and similarity of coursework, some credits may transfer, but they may not fully satisfy all requirements. While many agreements exist with local community colleges, most students who complete two years at a community college will have nearly all of their general education requirements, including math and physics, completed. However, they will still need to complete more than two years of engineering coursework due to the unavailability of some first-year and most second-year engineering courses at community colleges.

Based on the study's findings, it's recommended to phase out block tuition and replace it with less discriminatory alternatives that encourage continuous enrollment and lifelong learning. One potential alternative is providing a tuition credit for the next semester based on credits taken. For instance, if a student enrolled in 12 credits during the Fall semester, they would receive 3 credits free in the Winter semester. This approach can be easily scaled or pro-rated based on credits taken to ensure everyone receives the same percentage discount, thereby incentivizing continued enrollment. However, if an institution chooses to retain block tuition to encourage higher credit loads, the structure at GVSU, which resembled a BOGO promotion, proved more effective. Additionally, engineering programs can address inequities by reducing barriers for transfer students and minimizing the impact of prerequisites as much as possible.

In conclusion, while block tuition structures aim to promote higher credit loads and expedite graduation, this study highlights their unintended, disproportionate financial burdens based on race, particularly in engineering disciplines. While charging simple per-credit tuition would be more equitable, the benefits of block tuition can be achieved if the tuition model is structured like a promotion, and the unintended consequences can be mitigated by addressing other common systemic barriers.

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