

Persistence Priorities and Financial Servingness in an Emerging HSI

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Abstract—As the demographics in the United States' college going population continues to shift, the number of HSIs grows annually, yet research in higher education indicates a difference between enrolling Hispanic students in great numbers and serving the Hispanic/LatinX population [1,2]

Servingness is embodied in structures and practices that constitute HSIs, and is manifested in the acts of institutional agents who interpret policy, advocate for students, and access resources on behalf of students. This paper describes the findings from an initial case study of a public US east coast Emerging Hispanic Serving Institution recently funded by the National Science Foundation to provide scholarships for high-achieving students with great financial need. In an effort to understand financial barriers students face in attending college in a post-pandemic context, the first author interviewed key stakeholders at EAST STEM University. The research question driving the study was: *How is EAST STEM changing its infrastructure to develop diverse support structures that serve students?*

Data for this pilot case study were collected from unstructured interviews with the lead faculty member of the grant in the computer science department, document analysis of institutional data (e.g., contextual data from the US Department of Education, publicly available information from Excellencia in Education, institutional profile data from the Institute of Educational Statistics), and from formal interviews with key stakeholders across the university. Interviews were transcribed and coded using emerging themes with Dedoose software. The staff interviewed in this study span five administrative offices and academic departments.

Findings from this case suggest the institutional goals of promoting diversity and increasing persistence were values that aligned with the acts of servingness utilized at East STEM University to advocate holistically for student needs [3]. Interviews with institutional agents indicate two ways the institution supported student progression through the major-through human resource allocation and through financial prioritization for equity. Within this institutional context, institutional agents enacted servingness through their emphasis on equity and persistence priorities, with, in some cases, a critical lens supportive of student success[4]. Key to their efforts in promoting persistence for students were three actions—creating space for one-on-one engagement with students, advocating on students' behalf across multiple administrative offices, and adapting and reinterpreting policies to support continued student enrollment. This study illustrates how institutional agents aligned serving with a key institutional initiative, and shows how that alignment created space for innovation in meeting undergraduate students' financial needs.

Keywords—diversity, inclusion, equity, financial barriers, student support structures

I. INTRODUCTION

Undergraduate student populations in the United States are diversifying by race, ethnicity, age, and life circumstance, with Hispanic enrollment increasing 42% from 2009 to 2020 [5]. Still, STEM degree enrollment remains predominantly white, male and Asian—while 25.6% of all BS degree enrollments are in STEM fields, Hispanic students are less likely to enroll in STEM (22.4%) as are black students (17.7%). Intersectional populations are even more underserved—only 15.8% of Hispanic women enroll in STEM, and only 12.9% of black women enroll in STEM fields in the Bachelor's degrees.

Finances for college are disproportionately problematic for underrepresented student populations. Black and Hispanic students are more likely to have 0% expected family contribution to college attendance than their Asian and white peers, and less likely to have familial circumstances with an expected \$19,000 contribution or more [6].

Institutions are diversifying markedly, as is evident in the expansive growth in institutions qualifying as Hispanic Serving Institutions based on enrollment figures over the last decade [7]. While enrollment numbers within institutions show a greater share of LatinX or Hispanic undergraduates, most institutions operate with a default of enrolling and graduating predominantly white, middle class, continuing generation undergraduates—systems of higher education were built for these populations [8,9].

Institutions that embrace and plan for a diverse student body are said to exhibit “servingness” – servingness practices de-center whiteness in undergraduate education, purposefully redistribute taken-for-granted power, challenge implicit cultural expectations of higher education. Institutions that are said to serve diverse students *create diverse student support structures* for improved recruitment, retention, and advancement [10].

Case studies of servingness tend to focus on well established practices and solidified institutional cultures that have historical roots in local racial and ethnic communities. This pilot case study differs from the extant body of literature by emphasizing shifting practices in an emerging H.S.I. and documenting how financial policy and practice may lead the charge to improve students' experiences at East STEM university.

STEM departments tend to have worse persistence rates than other majors, and are less likely to have students migrate to the degree later in their educational pathways [11]. Engineering majors also tend to exhibit inequitable persistence rates across demographic groups [11] -thus servingness practices may be particularly valued in STEM focused institutions that are transitioning towards culturally

relevant policies and practices. This paper addresses institutional shifts in support for STEM students as part of explicit efforts to better serve diverse demographic populations. The research question that drives this study is: *How is EAST STEM changing its infrastructure to develop diverse support structures that serve students?*

II. THEORETICAL FRAMEWORK

This qualitative case study uses the lens of organizational change to thickly describe trends in one STEM-focused institution to support the well-being of students at EAST STEM. Organizational change research assumes that the case is a bounded system [12] in this case the organizational boundaries are the institution, called EAST STEM for the purposes of this study. Organizational change in higher education towards *serving* students is slow, difficult, and may be transitory, with some forces edging towards changes while others undermine it [13]. Because of the research question relating to *student support structures*, leaders and support staff with student-facing roles are highlighted in this effort, and the work of the institution to improve outcomes for underresourced and underrepresented students in EAST STEM.

1) Mechanisms for change

Organizational change theorists in higher education note the importance of shifting organizational infrastructure towards the change imagined to support transformation efforts [14]. Higher education research has established levers that support systemic change [10]. Postsecondary institutions are not likely to shift based on top-down edicts that are not supported with funds, training, or related attempts at disrupting the status quo unless institutional resources are diverted towards the desired change [12, 15, 16]. At the same time, grassroots efforts from staff, faculty, and/or student drivers for change are limited in their sustained impact [17].

Systemic change that supports inclusion and diversity efforts that lead to a change in academic and social climate on campus need consistent support, as well as an emphasis on values and mindsets that assume students care capable of learning in STEM [18]. Evidence from institutional efforts that created positive changes for diverse student success show effective use of a) supportive formal and/or enacted policy, b) financial backing, and c) human resources allocation that align with diversity, equity, and inclusion values [19, 20].

In this study, the emphasis on *diverse student support structures* in development at EAST STEM highlight how emerging HSIs are moving towards servingness. Research on Hispanic Serving Institutions indicate the institutional identity is often influx and that conflicting values may undermine the development of servingness policies and practices [21]. Evidence of structural changes are illustrated with detail in this pilot case study to describe *how* a STEM-focused university began to shift infrastructure to support more diverse student populations like those attending the institution and residing locally.

III. METHODS

This exploratory qualitative case study is part of a larger study of institutions that collaborate on a scholarship grant for engineering students who exhibit academic talent and financial need. S-STEM collaborative grant leadership were interested in better understanding financial need as well as institutional practices that support student success in their discipline. As the first author gathered data across institutions, the practices at EAST STEM emerged as warranting greater study. The social science researcher on the project began additional data collection with the key institution, utilizing snowball sampling methods of interviewing to gather interviews across the institution.

In all, data for this pilot case study were collected from interviews with the lead faculty member of the grant in the computer science department, document analysis of institutional data (e.g., contextual data from the US Department of Education, publicly available information from Excellencia in Education, institutional profile data from the Institute of Educational Statistics), formal interviews with 24 scholarship recipients, and 10 formal interviews with key administration and staff members across advising, financial aid, bursar, deans' office, and student services. Interviews were transcribed and coded using emerging themes with Dedoose software.

Triangulation occurred by source and source type [22]. For the purposes of this paper, the case is bounded by the institution, East STEM, and the time period beginning with the latest institutional strategic plan is targeting, 2020-2025 [23]. Constant comparative methods of coding were utilized to make meaning of the diverse student support structures being built in the emerging H.S.I. [24]. Data at this time focus on practices and policies that research shows could lead to impact on outcomes.

IV. RESULTS

A. Context of the Case

EAST STEM is a designated R1 institution in the northeast United States. The school is located physically in a community that experiences disproportionate poverty—28% of residents have household incomes considered below the poverty line. Demographic diversity in the community does not match the population of students enrolled at EAST STEM—while community residents are majority-minority, the enrollment of the school does not yet reach parity with the community. LatinX enrollment is nearing community representation, with 21% of enrolled EAST STEM students self-identifying as Hispanic/LatinX while 34% of community members are identified in the census as having LatinX/Hispanic origins.

Six-year graduation rates overall are 74% across the student body, yet these rates differ by racial/ethnic groups, gender, and financial status (Pell eligibility). Computer science and engineering BS degrees accounted for over half of degrees earned in 2022, according to the National Center for Educational Statistics.

B. Evidence of changes in institutional infrastructure

1) Financial priorities for diverse student success

The most distinct shift in financial priorities towards support for diverse students at EAST STEM has been a shift

in student financial support towards financially disadvantaged students in STEM. A leader in financial services describes the shift in this way:

“It’s amazing. Starting fall of 2021, we shifted our strategy in scholarship awarding. It was always about merit, because we were building our quality and we wanted students who were likely to succeed, not get all this debt, and not make it. We shifted that to need base because it made sense. We wanted more diversity, inclusion.”

We wanted to help our first-generation students who are also high achieving, but they’re needy. We revamped that. We increased our percentage of scholarships dedicated to cover need. We still give out merit, but the majority is need-based.”

Another way in which finances are shifted towards understanding the trajectories of under-resourced students is through stated, measured goals in the Strategic plan. EAST STEM has stated that it will measure recruitment and retention rates, and disaggregate these rates by demographic markers, at this stage by “URM” and “non URM.” Disaggregating data is a best practice in moving towards equity in higher education [25]—while URM retention could be disaggregated in more depth, the emphasis indicates a first step towards understanding equitable outcomes in the university. According to the Strategic plan document:

(EAST STEM will) Analyze student profiles and performance using data analytics to identify predictors of success beyond test scores and GPA, particularly for URM students. Developing more robust decision making tools for university admissions will provide opportunities for more students while also improving retention and graduation rates for admitted students.

The table below illustrates the ways in which EAST STEM intends to measure progress in the coming years as it relates to diversity. By tracking these data in greater detail than before, EAST STEM exerts financial resources towards data use that centers diversity.

Objective	Metric
Student success	Retention rate, first time student enrollment Retention of transfer students into their third semester at EAST STEM 6-year graduation rate
Promote diversity	Percent of students who identify as Hispanic/Latinx Percent of students who identify as black/African American Percent of women students Underrepresented minority retention rate Underrepresented minority graduation rate
Enrollment	Total enrollment Average SAT Composite score Number of freshman applications Number of masters’ applications Global campus FTE
Recognition	Number of students applying for/receiving prestigious fellowships and/or awards Number of students/student teams winning competitions

TABLE I. MEASURING STUDENT OUTCOMES AT EAST STEM

2) Human resources for diverse student success

Evidence across case study data sources indicate how EAST STEM has dedicated human resources in the form of

staff positions, as well as staff and leadership dedicated time allotment to fortify student support structures for persistence.

The strategic plan document specifies targeting students who are not graduating, identifying the barriers they face, and applying proactive advising to support student progress.

Initiate proactive advising, implement programs to identify and support at-risk students not performing at their full potential, and develop a better understanding of the reasons students leave NJIT without graduating. Identifying and supporting students who may be struggling will improve educational outcomes.

A leader in financial services described a staffing change to support persistence in this way:

“That’s our population of students and we actively reach out to those before registration opens to help resolve blocked registration. We have two people committed just for that. Two people in the retention office it’s called the Office of Persistence. Then I have one person dedicated to help them as well because they need to know well what’s missing in their paperwork.”

Adding staff who support students in navigating finances, administrative offices, counseling practices, and financial planning indicates an understanding from leadership that student retention is, in part, the responsibility of institutions. This critical stance acknowledges that student and familial experiences are inequitable—retention for all students means increased access to institutional agents who advocate for first generation students. In addition to new staff members whose positions involved direct student services, the time that leaders have allocated for fast feedback to students on financial hardship requests indicates systemic, dynamic, and timely support for students with immediate needs. One member of the Hardship Committee described efforts to inform students of their decision within 7 days.

“The hardship committee is made up of different members from different departments that affect the student’s wellbeing. Dean of Students office, financial aid, leaders in finance, myself, and a couple other individuals. Potentially, students can apply for hardship anytime that they feel that they having a problem with or issue. The hardship committee, we meet every week. At least we try to give an answer within a week once they apply. We do review before the committee meets. We do review each of the cases.”

In the quote above, the stakeholder describes the regularity and timeliness of the hardship committee meeting. The goal of providing students timely feedback regarding their requests shows an understanding of current EAST STEM students’ dynamic lives, and the extent to which financial insecurity can disrupt student trajectories in STEM.

3) Financial policy implementation and interpretation for diverse student success

In interviews with key stakeholders, elements of enacted policy, or the ways policies at the institution are translated into practice were an area of emphasis [26]. Evidence suggests stakeholders’ interpretations of policy were in line with building diverse student support structures. Data coded with this concept were described across departmental lines, among leaders and service support staff members. The enacted policy regarding student finances involved four elements—one on one, proactive engagements with students;

broad-based, accessible communication methods; cross-departmental decision-making and resource leveraging. The stated goals of the enacted financial policies included student persistence and student welfare.

a) One-on-one engagement with students

STEM students may disappear from rosters without departmental and institutional knowledge of reasons for withdrawal or stop-out—as enrollments increase in STEM departments, faculty and departmental staff may or may not be aware of their departure until deadlines have passed. Communications from staff with specialized knowledge of registration deadlines, financial policies, and advising considerations can support persistence in STEM through one-on-one engagements that target the administrative factors that might slow up student retention.

*“So we try to be proactive and we’ll email all students when registration is opening, so it could be undergraduates, graduates, and PhD students. And then once priority registration opens for those students, we then keep a running list of who has not yet registered, and then we do targeted outreach to them. **People that might have an advisor hold, people that have a bursar hold, we’ll do specific text, calls, and emails, depending on what we’re working on at the moment and how personal our touch needs to be for that student.**”*

b) Broad-based, accessible communication channels

Key information that students need to progress in STEM degree programs often come through official channels, such as email, or physical mail, and are imbued with technical jargon that puts off students [27]. The information is depersonalized and routes towards resolving issues may remain unclear. Data from the case study at EAST STEM indicates financial issues are resolved through one-on-one interaction with students, rather than passive, unidirectional communications. A leader in finance described their processes this way:

*“Like I said, we offer online virtual meetings to assist and facilitate what’s convenient for the student. We have virtual appointments daily for all students, so they can quickly jump on a Zoom and talk to us. **We try to make it easier for them when it comes to servicing them.**”*

Targeted information regarding student progress is sent directly via mediums that are more student friendly—text. The immediacy (and perhaps the lack of formality) of texting can clarify financial obligations and next steps for students experiencing financial complications in their studies.

*“Text. Text. Texting students. Yeah, they’re very responsive. ... you have to meet them where they are. And everyone’s walking around with their phone in their hands. And like I said, previously with emails, they’re getting a ton. And so that’s not their top priority to sift through emails when they’ve got tons of studying to do. It’s a very rigorous program. **So we find texting, and then also picking up the phone, are effective.** You can have a quick conversation with somebody. “Hey, are you coming back? How can I help you?” And you catch their attention and they want to hear more, so—”*

c) Cross-departmental decision-making, resource leveraging

In some cases, financial stakeholders at EAST STEM described practices of compartmentalization that supported decision-making for the good of the students. An interviewee remarked that while other schools consider ability to pay in admissions decisions, EAST STEM made it a practice not to make student acceptance decisions this way. Instead, financial stakeholders hold students accountable for payment behaviors while enrolled in school.

*“That one is tough because we’re an institution that **we don’t look at finances to offer admission.** I know some schools do. I won’t name any of them. But so we don’t look at finances. It’s basically we look at your grades. We look at your SATs, and the factor’s determined from there. And so, in a way, I don’t see any of their finances as far as the bursar side. Maybe admissions do, but I won’t be able to respond to that at all. I know the finance when they get here because I look at their... That’s the other thing, we don’t look at their current finance. It’s not like, “Oh, you have a job.” We don’t ask that at all. We just try to help them out as much as possible.*

I think it’s best business practice (to separate admission from finances) because... Some schools do, some schools, they do say that we look if you could pay us or not. I think private colleges do that. And that’s based on your acceptance. But no, we don’t. We treat every student practically the same. And then, your history will dictate how down the road, if you claim hardship, like we talked about. Because it’s tough. If a student comes and doesn’t pay us for two years, I won’t let them register. I’m sorry. It’s hard, especially for me, it’s hard, but I have to put your account on hold until you pay.”

Another financial stakeholder described an impression of student avoidance, with a willingness to support students as they seek help with a multi-pronged, cross agency strategy.

*“(Managing financial problems at school) probably caused conflict, turmoil. Sometimes they want to just avoid it. You have that population of students who don’t even pay the bill, don’t even give us the documents that we need to give them the money. It’s a denial and then they get \$500 late fee put on it. It becomes a bigger problem every year....Then when they’re forced to come forward because they can’t register because they have full money, then they submit an appeal to the financial hardship and say, “I need help.” That’s when we’re like, “Here do this, do that. Let’s get you this money and then let’s fill your gap. Then what can you do? What can you pay? Take the loans out.” **Then it becomes all hands on deck to solve the problem.***

We have that certain number of students like that. That’s our population of students and we actively reach out to those before registration opens to help resolve that.”

d) Student advocacy across campus

Staff described roles they take up as student advocates—intermediaries between the student and the office or staff member they need to successfully resolve academic issues. For example, academic holds can disrupt enrollment, and often the holds are contingent upon other stakeholders’ responsiveness. Retention staff can serve as intermediaries to support timely feedback from other institutional staff. In their positions as student advocates, staff and institutional stakeholders may take up stances critical to bureaucratic, institutional norms.

"Sometimes they can't get ahold of their advisor, or there's no appointments listed online and I'm not sure why. And so we'll reach out to them to say, 'Hey, can you help this student?' Or, you go to their supervisor and say, 'Hey, is there anyone that can help this student?' So it really could be anywhere that this student needs help."

In some cases, retention staff take up flexible stances on policy implementation, and encourage others to make decisions that enact policy with care for student well-being.

"I see myself as an advocate for students. If I see somebody... Somebody comes across and it's too late, we're already... Now we're in the reactive stage. What can we do to help them? My office is one of the very few, we give out a lot of micro scholarships. And so what we often will do is like, 'If you pay this amount, we'll give you this amount.' And then we'll try to help you get registered and things like that. So, we try to help. And then also, I advocate for the student in that, 'Can't you break a rule? Can you just... 'Can we fix this?' or 'Here's what happened and is there any flexibility on the deadline?' Because they don't know to ask those questions, so then I do that for them."

e) Mending of bureaucratic harms

Student financial disruption can be caused by misaligned timing of funding agencies and institutional expectations. Financial stakeholders describe these misalignments as issues that are automatically fixed in students' favor, to avoid additional fees, for example.

"Sometimes, federal government might be dealing, providing the scholarship through the federal government. So, when the deadline for payment comes, the federal money might not be there yet. So, they'll incur a late payment fee. And then, maybe a couple days later, the federal payment appears. So, we will waive that fee, the late payment fee without any question. Because it's just the timing of the payment. I don't blame the students for that. Those are the easy decisions that we see, and we review that almost every day."

"Federal and the state had to do with your taxes or what you report and depending on your income level as well. But for EAST STEM, what we do is we support them in different ways. For example, payment plans. Every semester, we have payment plans, and to stretch out the payment for a spring or fall. We do have hardship cases. These cases are special. And I develop an in-house payment plan, which is helps out student to start their fall with less of a balance."

f) Flexible with finances

Financial stakeholders describe how EAST STEM approaches financial barriers differently than others, with an eye towards serving students through flexibility and care. Financial penalties and debt are considered from a student support lens, and steps are taken to enact policy flexibly to address student need.

"I think we're very, very flexible because other schools, they drop you if you don't pay your balance, they drop your courses. Here, we don't do that. We want to work with students. We actually let them carry a balance if they owe us money. We're even as liberal as that. We don't even put holds

on if they owe some dollar amount and less than that dollar amount."

So mostly, we work with financial aid. We work with the bursar. We will work with the registrar. There's refund periods. They might miss a day. They miss a day where they might have gotten a 90% refund and they're getting 50% because they missed it by one day. So I'll ask the student, 'Can you file this hardship appeal?' And then it goes to a whole committee, which involves Dean of students, the head of finance, the associate provost is on that committee."

g) Holistic view of student well-being

Stakeholders who support EAST STEM students through financial barriers do not see tuition and fees as students' only potential financial needs—their interview data indicate a holistic view of student hardships and resource requirements—some of the leaders who work to support students financially have multiple avenues for providing resources students lack as they matriculate through their STEM program.

"So in my role, in terms of their financial struggles, if you will, my role comes in after they're here a lot of times. So it might come in where I don't have enough money for housing, I don't have enough money for books. I need a computer. So everyday thing, or even certain things like transportation, I don't have enough money to get to my, to get to school. I don't have enough money to eat. So that's where my office comes in a little bit there where we have some other funding that we try to use to help students. So for example, if, if a student comes in says, you know, I'm a hundred percent homeless I don't know to do, but I don't have the actual dollars. Then Residents Life falls under me. I contact my director over there, say, 'Hey, look, I have a student who needs to place to stay.'"

The finding regarding holistic views of student well-being was triangulated across administrative offices—the quote below, which considers financial hardship in the context of students' lived experiences, reiterates the perspective shared above, but from a different side of campus.

"If someone is going through a financial hardship, like a death in the family and they have to take a flight to their home to see, or to go to the funeral, things like that, or they can't pay their bill, their light bill or their gas bill. We have that and we give out \$500."

V. DISCUSSION AND RECOMMENDATIONS

Findings from this case suggest the institutional goals of promoting diversity and increasing persistence were values that aligned with the diverse student support structure utilized at East STEM University to advocate holistically for student needs [3,10]. Interviews with institutional agents indicate ways the institution supported student progression through the major-through human resource allocation and through financial prioritization for equity. Staff implemented and enacted policy that supported flexibility, individualized guidance, and care to support persistence. Within this institutional context, institutional agents enacted servingness through their emphasis on equity and persistence priorities, with, in some cases, a critical lens supportive of student success [4]. Key to their efforts in promoting persistence for students were three actions-creating space for one-on-one

engagement with students, advocating on students' behalf across multiple administrative offices, and adapting and reinterpreting policies to support continued student enrollment. This study illustrates how institutional agents aligned serving with a key institutional initiative, and shows how that alignment created space for innovation in meeting undergraduate students' financial needs.

This pilot case study in a STEM-centered institution suggests multiple recommendations for engineering departments striving to increase persistence of diverse, non-traditional, financially vulnerable, and first-generation student populations who may face barriers to continued attendance and achievement in engineering. Faculty and advisor understanding of administrative deadlines and policies influencing student enrollment and adequate progress in the major can support students in making good decisions about coursework that may have consequences for their financial aid. This may be particularly key for those teaching high stakes courses that serve as gatekeepers to additional coursework (e.g., mathematics pre-requisites, early sequences in the major). Departmental engagement with student services staff could enhance policy transparency, and may lead to student-serving enactment of policies that currently inhibit student progress. Learning from student wellness representatives about students' day to day lives may create opportunities for faculty and staff empathy and relationship-building with students, particularly as enrollments swell in US higher education contexts.

VI. ACKNOWLEDGEMENTS

This material is based upon work supported by the National Science Foundation under Grant No. 2129795.

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