Original Research

Mamelodi Pre-University Academy: Aligning Campus Strategic Goals to Achieve a University's Anchor Institution Strategy Mandate

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Abstract

The University of Pretoria (UP) adopted an anchor institution strategy and designated the Mamelodi Campus as a faculty with a focus on community engagement with the primary goal of broadening educational pathways to post-secondary school attainment. As a conceptual shift from the community engagement literature, the Mamelodi Campus identifies the role that it plays and its relationship with the Mamelodi community as part of its "anchor" institution strategy. This paper provides an overview of how two strategic goals of the university, namely widening access and success and strengthening social responsiveness, have manifested over a decade through designating STEM access programs to a campus located in the impoverished township of Mamelodi. The anchor mission entails improvement of the access programs through incorporating the student voice, as well the improvement of the after-school programs (ASPs) by formalizing a Pre-University Academy (PUA). The PUA is a signature academic program geared towards fostering articulation between the high school initiatives, access programs, and the mainstream programs to ensure a seamless transition from secondary school to graduation. A case study methodology was followed to highlight the lessons drawn from the provision of the programs which resulted in forward and backward articulation to close the school-university gap while addressing systemic educational problems left by the legacy of apartheid. The paper further elaborates on the process followed to cement the

anchor mission through the PUA as well as make recommendations to strengthen anchor institution strategy efforts in similar contexts

Keywords: Anchor institution, community engagement, STEM, extended curriculum programs, after-school programs

Introduction and Background

The shift in South African higher education institutions from being academically exclusive to becoming engaged, inclusive, and diverse has been progressive since independence in 1994 (Birch, Perry & Taylor, 2013; Hendricks & Flaherty, 2018). In the overview on South African University history, Strydom (2016) takes note of the role of South African universities under the apartheid regime, whereby the focus was solely on the milestones the universities achieved, with little or no mention of the universities' function in their socio-economic and political contexts. South African universities, under the apartheid regime, seemingly romanticized their roles as higher education institutions whereas the post-apartheid narrative of universities is critical and cognizant of the socio-political and economic landscape of the communities in which they are embedded (Strydom, 2016).

The post-apartheid University of Pretoria has adopted an anchor mission strategy whereby the anchor strategy mandate aims to improve the economy and infrastructure of the communities in which it is located and thus do away with societal ills, paving the way for academic access, success, and community engagement (Hendricks & Flaherty, 2018). In its endeavor to provide access to higher education, employment, and security, the university is cognizant of the importance of diversity, particularly to ensure that the campus community mirrors the socio-economic and racial diversity that exists in the South African community (Hendricks & Flaherty, 2018; Strydom, 2016). The policy adopted by the university aims to eliminate barriers between academia and the community and to foster community integration and improvement.

In light of the university's exclusive past, the policy places emphasis on the support for students from disadvantaged backgrounds (Hendricks & Flaherty, 2018; Strydom, 2016). The university has thus designated the University of Pretoria's Mamelodi Campus as a hub for community engagement with a focus on enhancing access and successful student learning, as well as strengthening social responsiveness and impact in society. The Mamelodi Campus is geared towards broadening educational pathways for postsecondary school attainment through provision of access programs in science, engineering, technology and mathematics (STEM). The purpose of this article is to show how, with the adoption of an anchor institution strategy, the Campus' activities moved from a community engagement approach (focused on student learning, transformation of faculty into engaged scholars, partnerships fostered through teaching, learning

and research) to an anchor mission approach (community impact driven through a variety of activities such as procurement, hiring practices, as well as teaching, learning, research and service). Our understanding of how the two constructs differ and are similar is informed by the recent article by Norris and Weiss (2019). While community engagement projects can be global in nature, anchor institutions define community in terms of local contributions. The emphasis for community engagement work is on how institutions work with the community as opposed to where the engagement occurs. Although the university has an office that focuses on its social impact nationally through community engagement activities, the Mamelodi campus employs a hyper-local approach towards implementing an anchor mission geared towards addressing the socio-economic challenges in Mamelodi. The campus fulfills its anchor mission by forging partnerships with entities working in the Mamelodi education ecosystem to increase the number of youth attaining post-secondary school qualifications. Mamelodi township has an estimated population of 334,577; this excludes the burgeoning informal settlements, which places the estimated total to approximately one million residents, most of whom are predominantly black. With only 9.5% of the population having had access to higher education, Mamelodi is an urban community with a high unemployment rate whereby 18% of the households have no income while 73.7% of the population are of working age,15-64 (Census, 2011). Although plagued by social and economic ills, the Mamelodi Township is rich in cultural, educational, infrastructural, social, and economic diversity and is therefore fertile ground for the implementation of an anchor strategy; these factors render the mobilization of assets and resources amongst the university and the community accessible and sustainable (Cantor, Englot, & Higgins, 2013). A process of reflection and consultation with internal and external role-players led to the development of a campus anchor strategy that would not only address the community engagement mandate of the campus but also achieve the strategic goals of the university.

In 2017, the Kresge Foundation awarded UP and Rutgers University-Newark (RU-N) a planning grant towards their anchor institution strategies in their respective communities in Newark and Mamelodi. The UP Mamelodi Campus thus developed an anchor mission strategy called the Mamelodi Collaborative (MC). The MC addresses five key areas: (a) broadening educational pathways for post-secondary school attainment; (b) leveraging the arts and culture; (c) science and the urban environment; (d) strong, safe and healthy neighborhoods; and (e) economic development and entrepreneurship. These key areas focus on bridging the poverty, crime, education, and unemployment gaps in the Mamelodi community through community and district partnerships and a data led approach.

This paper focusses on the niche area of broadening educational pathways and, more specifically, access and success to tertiary studies in STEM for the youth of the community. The paper elaborates on how the campus arrived at a more comprehensive approach to broadening pathways to STEM and closing the school-university gap through pre-university activities and access programs.

Literature review

An anchor mission strategy is the intentional deployment of an institution's geographically bound assets and economic power to revitalize neighborhoods where individuals face historic barriers to economic growth and survival (Dragicevic, 2015). The anchor mission strategy is implemented by anchor institutions which are described as large, non-profit organizations grounded in communities to ensure the mutually beneficial progress and well-being of the communities in which they are rooted (Dragicevic, 2015; Friedman, Perry, & Menendez, 2014). Anchor institutions are largely developed in urban societies where the institutions mobilize their resources towards the strengthening of the surrounding neighborhood (Dragicevic, 2015; Ehlenz, 2018).

Due to global socio-political, socio-economic, and resource instabilities, universities have had to reinvent themselves in order to remain relevant in the ever changing world and communities in which they are embedded and function (Ehlenz, 2018). The focus of universities both theoretically and practically has changed over the years from being academically exclusive, which hindered educational access to the broader community, to universities being agents for neighborhood revitalization, change, and development (Birch et al., 2013; Ehlenz, 2018; Hendricks & Flaherty, 2018; Smith, Pelco, & Rooke, 2017). The systematic review by Nkoana and Dichaba (2017), addresses the increasing core mandate of university-community engagement (UCE) across South African universities with aims to alleviate the poverty, inequality, and unemployment in the South African community. The study, however, highlights how the lack of a UCE framework and a data trail may do more harm than good as the systemic review noted the lack of UCE data and reports from other institutions around South Africa. Although South African universities run community engagement programs countrywide, the, University of Pretoria is the first of its kind in the country to adopt an anchor mission mandate. The adoption of an anchor mission strategy is a major shift in community engagement literature towards a measurable impact in collaboration with the community in a defined geographical location as well as developing the locality intentionally and holistically compared to community engagement activities that emphasize service-learning often to meet the requirements of a university curriculum.

Universities driven by socio-economic constraints within the societies in which they are embedded build mutually beneficial partnerships with other community institutions, towards affecting a positive change thus acquiring the anchor institution status (Bergen & Sladeck, 2019). The report by Hahn, Coonerty & Peaslee (2005) states that the focus of an anchor institution should be developing the economy of the community despite the challenges that anchor institutions face in the planning and collaboration of community outreach programs as well as interdisciplinary programs. Various universities have adopted and successfully implemented the anchor strategy. However, Bergen and Sladeck (2019) argue that while the anchor mission

strategy may improve the quality of life of the targeted communities as a whole, it may not improve the welfare of permanently resident low-income and oppressed individuals in those communities and will, in fact, drive them out of the community due to the ripple effect of a higher standard of living. Anchor mission strategies thus fall short in addressing the development of generational wealth of the poorest individuals in their allocated communities (Bergen & Sladeck, 2019).

Through the use of surveys, Ehlenz (2018) compared the theory and application of the anchor mission strategies to examine the extent to which universities invest in neighborhood revitalization. Ehlenz (2018) states that theoretically, the likely advantages associated with the successful implementation of the university anchor mission strategy is the notable development and improvement of infrastructure, security, social, economic, as well as the quality of life of the targeted communities. The structural and economic development is thus meant to encourage investor buy-in and, in turn, affect the educational and school going trends of its learners and students in the community (Ehlenz, 2016; Ehlenz, 2018). Such is evident in the anchor institutions addressed in Hendricks and Flaherty (2018) where the infrastructural development and community engagement, as well as economic investment by the University of Pennsylvania, Midtown Detroit, and the University of Maryland saw an increase in the economy, safety, and investment in the areas.

The literature consulted highlights the success of international universities in the implementation of the anchor mission strategies while few studies exist which address the application of the anchor strategy in the context of South African universities. The predominant factor that stands out in the university anchor mission strategy literature is the data driven evaluation and monitoring of anchor mission strategy activities. Furthermore, the successful anchor strategies mentioned above focus increasingly on the infrastructure and economy of their neighborhoods and do not elaborate on the implementation of the education access, retention, and success of learners and students in the community schools, as well as the students enrolled in the universities.

Unlike international universities where notable success in the implementation of anchor strategies is evident, South African universities lag behind in this regard (Bank, 2018). Consequently, the University of Pretoria, in its implementation of the anchor strategy, has noted these gaps and seeks to not only improve the infrastructure and economy of the communities in which its campuses are embedded, but to also improve academic access and success, as well as foster sustainable community development that enhances the lives of the communities in which the university is located (Hendricks & Flaherty, 2018). The impact of the university through community outreach is vital in addressing the needs of individuals in the community and thus it is important to have a research and data driven approach in addressing societal constraints in the Mamelodi community. The University of Pretoria has set out to achieve its anchor mission of

extending and improving academic access and success for the youth of Mamelodi through its after-school programs which have been in operation since 2012.

After-School Programs

After-school programs (ASPs) with a strong academic focus, are one of the ways in which civil society has responded in an attempt to counter student under-preparedness. ASPs have a long history globally and the conditions that shape their development reflect societal concerns regarding child development (Lauer, Motoko, Wilkerson, & Apthorp, 2006). The concerns vary from one society to another, hence ASPs vary widely in goals and practices, making it difficult to assess their effects as interventions. Adding to this complexity is the need for ASPs to be developmentally appropriate and attractive to participants. Several scholars who have conducted systematic reviews of ASPs (Lester, Chow & Melton, 2020) found that while a number of promising models exist, many exhibit encouraging and yet methodologically flawed evidence of effectiveness. Programs that provide greater structure, a stronger link to the school-day curriculum, well qualified and well-trained staff, and opportunities for one-to-one tutoring hold promise.

The absence of academically rigorous research in the operations and outcomes of supplementary programs is demonstrated in the seventh systemic review summary conducted by International Initiative for Impact Evaluation (Snilstveit et al., 2016). The review evaluated the impact of interventions for improving learning outcomes and access to education for learners in low and middle income countries. Snilstveit et al. (2016) demonstrated that most programs operate with little evidenced led practices. There is a need for future studies on after-school programs to implement rigorous designs and report on aspects of program quality. Improving the rigor in the design of the programs as well as the evaluations of after-school programs is crucial and can provided valuable information to realize the potential of after-school programs (Kremer, Maynard, Polanin, Vaughn & Sarteschi, 2015; Lester, 2020).

Elements of an ASP for redress

From the literature it is clear that a meaningful ASP model should be able to at least consider the socio-economic situation of the learner and structure innovative measures to minimize its negative impact for success in school and beyond. In addition, the model should provide the learner with the skills set relevant to the demands of the 21st century. The following elements are proposed as crucial to the success of an ASP for redress: (a) a learner responsive environment through parent-school-community partnerships; (b) academic preparedness/ readiness; and (c) post-secondary school awareness referring to college and career prospects.

A learner responsive environment through parent-school-community partnerships

The African saying, "it takes a village to raise a child" rings increasingly truer in a context where youth is responsible for criminality on school premises. Schools can no longer turn a blind eye to societal ills as it no longer only manifests itself in the home environment. Healthy school, family, and community partnerships lead to improved academic learner achievement, self-esteem, school attendance, and social behavior (Lemmer, 2007).

A learner responsive environment refers to an environment where educational matters are addressed through joint efforts of educators, learners, parents, members of the local community, and the education department. Such an environment makes learners equal contributors to the partnership by encouraging them to be engaged in their schoolwork. As much as Lemmer (2007) was talking from a schooling perspective, the same collaborative approach is necessary when it comes to ASPs. These programs are best positioned at the interface where all entities meet. After-school program models without a collaborative approach, tend to "take the responsibility of teaching off the hands of the teacher." The comparative limited time available to after-school practitioners is already putting the prospect of obtaining superior results at risk. A similar message is communicated if ASPs are run separate from parental involvement.

Support programs can therefore have greater impact if they are school based or communicate a strong school/parent/ASP partnership aimed at the specific needs of the learners of the school. It then continually contextualizes the leaners' environment and allows for greater alignment between ASP and school activities. Teachers and parents could also have input in what the learners need at a specific point in time. Children become used to a longer school day which can enhance their work ethic.

Academic preparedness and college and career readiness

Kivunja (2014) asserts that whereas a learner or student in the past would have been considered academically prepared if they possessed the traditional core subjects and skills domain (i.e. the 3Rs of reading, -riting and –rithmetic) appropriate for a particular exit level, this is now considered inadequate. The learning and innovations skills as well as the digital literacies skills are additional prerequisites for academic preparedness. Academic preparedness is inextricably linked to college and career readiness, hence it is upon the institution and community to instill the career and life skills domain in the individual.

This paper therefore addresses how the University of Pretoria, Mamelodi campus, through the decade long provision of the Extended Curriculum Programs (ECPs) and ASPs, lessons learnt and a data-led approach, aligned its strategic goals of access and success and social

responsiveness to achieve its anchor strategy mandate. The paper aims to answer the following research questions:

Research Questions

1. How did the University of Pretoria's strategic goals of widening access and success and improving social responsiveness and impact manifest through the Extended Curriculum Programs and the After-School Programs between 2008 and 2018?
2. What lessons were learnt through the provision of these programs which enabled an improved strategy that addresses the school-university gap in a holistic manner?
3. What processes and activities did the campus engage in to arrive at a data led-approach in broadening educational pathways and cementing the anchor institution strategy in the Mamelodi community?

Context

Typical of the South African urban model developed under apartheid, the Mamelodi Campus, previously known as Vista University, is situated on the urban periphery, approximately 20 kilometers north-east of the capital city, Pretoria. The apartheid government established the Vista University in 1981 (Landman 1989) to provide university-level education for black persons in urban areas, with particular reference to the training of secondary school teachers. The post-apartheid Minister of Higher Education, Kader Asmal, designated UP as one of the institutions to incorporate a Vista Campus as part of the reconfiguration of the higher education system, which was legislated in 2002 (Akor 2008:172). The council designated the Vista Mamelodi Campus as a community engagement hub with a focus on providing access to STEM programs after a 2007 review of how the Vista Mamelodi Campus could contribute to the academic repertoire of the University of Pretoria.

By designating the campus a hub with a focus on STEM the university aimed to contribute to addressing this challenge of poor education systems, inadequate service delivery, and poverty which are still defining characteristics of township communities. Such challenges are a consequence of the socio-economic injustices that transpired in the country during the apartheid regime which affected predominantly black communities (State of the Nation, 2019).

One of the enduring challenges in the education system in South Africa is the low number of high school learners from disadvantaged communities that access STEM study programs. In fact, statistics have shown that the number of students who qualify with a National Senior Certificate (NSC) for entry to degree study, and those who have passed important "gateway" subjects such as mathematics, physical science, life sciences and English (home and first additional language) remain limited (Department of Basic Education, 2016). This is due, in part, to limitations and

challenges in the schooling system. To that end, in 2008 the university introduced three access programs at the Mamelodi Campus, to replace the University of Pretoria Foundation Year (UPFY) program which was a STEM pre-university bridging program previously offered at the Hatfield Campus. These access programs are the Bachelor of Science extended curriculum programs in biological and agricultural sciences, physical sciences, mathematical sciences, and economic and management sciences. ECPs have been introduced with support of the Department of Higher Education and Training to address under-preparedness of incoming students for the mainstream programs at higher education institutions.

Unlike the UPFY, the ECPs are formal degree programs and students register for a BSC degree from the onset. ECPs are considered more effective in terms of articulating with the mainstream programs (Rollnick, 2010). The ECPs offered on the campus thus constitute the nucleus around which the academic identity of the campus is developed and are aimed at widening access to mathematics, commercial, and science-related careers for largely first-generation students coming from disadvantaged school backgrounds. ECPs are particularly important in South Africa where under-preparedness for university study is a majority rather than a minority phenomenon now and into the foreseeable future.

Teaching in the ECPs is specialized to give students the necessary support to address under-preparedness. Studies conducted between 2014 and 2016 have determined the positive impact of the Mamelodi campus ECPs and have proven the success of ECP's while citing areas of improvement (Engelbrecht, Harding & Potgieter, 2014; Ogude, Meyer, Mwambakana & Mthethwa 2019). Following the positive results from these studies the campus turns its focus towards the development of a model that would address the school-university gap prior to students enrolling at university, that is, while they are at school. If successful, this strategy which entails backwards articulation (Case, Marshall & Grayson, 2013) can complement the forward articulation of ECPs resulting in a holistic approach to close the school-university gap and provide access to larger numbers of students.

UP Strategic Goals and the Mamelodi Campus

UP has identified five strategic goals as its key focus areas from the year 2019 going forward, namely:

1. To enhance access and successful student learning
2. To strengthen the University's research and international profile
3. To foster and sustain a transformed, inclusive, and equitable University community
4. To optimize resources and enhance institutional sustainability
5. To strengthen the University's social responsiveness and impact in society

The Mamelodi campus is designated the university's social innovation hub with a focus on strategic goals one and five.

Student Access, Success: From Extended Curriculum Programs to ASPs

ECPs have succeeded in widening access for students into STEM and economic and management sciences fields since their introduction on the Mamelodi campus. For the past decade the student population on the Mamelodi campus has grown by over 200% from the initial 300 in 2008 to 850 in 2018 which comprises approximately 10% of the total first year intake (Bureau for Institutional Research and Planning, 2017) The overall module pass rate during this period has also been consistently high, averaging 83%, which is in line with the benchmark of the Department of Higher Education and Training of 82% (Bureau for Institutional Research and Planning, 2017) . Since 2008, ECPs have been the flagship academic programs of UP's Mamelodi Campus and the bedrock on which the thematic multi-disciplinary nature of the campus, its academic identity and its anchor strategy the MC, was conceptualized in 2018 (Birch et al., 2013).

In light of the major successes of the ECPs, and as the nucleus around which the anchor strategy is conceptualized, it became important that they are strengthened even further from an institutional perspective. This necessitated a critical reflection on how the programs contribute by ensuring that more learners from Mamelodi, access the ECPs as well as other UP mainstream programs. This reflection resulted in the following observations: (1) The numbers of learners that apply to the University of Pretoria from the Mamelodi schools have seen an upward but steady trend between 2014 and 2017, at 346, 336, 346, and 362, respectively. However, there is a concern that these numbers declined in 2018 to 246 and are generally very low. To put these numbers into perspective, of the 496 grade 12 learners from the 20 Mamelodi schools, 31%, obtained a university entrance in 2017. Thus, the numbers that applied in 2017 constitute 73% of the Bachelors passes obtained by the twenty schools in Mamelodi. The target is to increase this number by 20% in 2021 to 93%, an average of 4% per year. (2) Unlike the application rate, the realization rate, that is the number of students that are admitted to the university, including the Mamelodi Campus, has been on a downward trend over the three years, 2015, 2016, and 2017 standing at 70%, 66%, and 63% respectively. This number may not be as high as it should be as admission point scores of some of the learners may not meet the UP criteria for admission.

In light of these observations, the university had to reflect on the extent to which its goal on access aligns with its anchor role in the Mamelodi Community. With such few students gaining access to the university, there was a misalignment which needed to be addressed. Furthermore, the university resolved that it could make a contribution beyond enabling students' access to its academic programs by advancing its social responsiveness mandate. In this way, the university

can contribute broadly to educational achievement through strengthening access to other tertiary institutions as well.

In an effort to further broaden access to STEM, in 2012 the Mamelodi Campus introduced a STEM ASP, in partnership with the Gauteng Department of Education's Tshwane South District Office, which is responsible for the schools in Mamelodi and surrounding areas. The target group of the ASP was 450, grades 10 to 12, learners from 20 high schools in Mamelodi, Nellmapius, and Eersterust. The ASP initiative was intended as an additional pathway for previously disadvantaged learners to gain admission to primarily STEM programs at the University of Pretoria. Lessons learnt from the research conducted on the ECPs thus led to the introduction of the STEM ASP to increase the chances for the learners of Mamelodi high schools to access the ECPs or mainstream programs and address the school-university gap through backward articulation. Studies have shown that intervention at the ECP stage is rather too late given a schooling system that is consistently producing underprepared students (Case et al 2013).

Student Access and Success and the STEM After-School Program

An introduction of the STEM ASPs to improve the performance of grade 10 to 12 learners in mathematics and physical sciences from the 20 high schools in Mamelodi and an associated Teacher Mentorship Program offered to mathematics and science teachers for grades four through nine, enabled the campus to reach about 300 schools and up to 180,000 learners indirectly. An evaluation of the ASPs showed that in 2015, 33% of students in the ASP learners were admitted to UP (mainstream and extended programs). In 2016 this figure rose to 45%, an increase of 14%.

Cognizant of the need for collective impact, the campus formed a strategic partnership with providers of similar programs in the Mamelodi area in 2015, herein lay the novelty of the ASP model employed. These partnerships significantly enhanced the impact of the ASPs. Learners participated in weekend mathematics and science classes offered by one of the partners called *Kutlwanong: Promaths* and attended the UP ASPs once a week for self-paced tutorial exercises using e-learning software. In addition, learners benefited from the many enrichment and empowerment activities offered by an internal UP entity, JuniorTukkie, ranging from life skills, study methods, time management, computer literacy, and reading skills development to bursary information and assistance with admission applications. Learners also attended the JuniorTukkie spring and winter school program for grade 10 to12 learners, which were offered on campus during school holidays. The partnership with external entities was further strengthened by partnering internally with several academic departments such as the Department of Educational Psychology and the Department of Science, Mathematics, and Technology Education, as well as student-led organizations such as the Postgraduate Student Association for the Natural and Agricultural Sciences (PSANA).

From the period of 2013 to 2018, assistance in mathematics and physical sciences was provided to an average of 800 grade 10 learners, 440 grade 11 learners, and 320 grade 12 learners. In total, 44 pre-service teachers served as tutors and, in the process, consolidated their own science and mathematics understanding and developed familiarity with the government prescribed curriculum. This ensured effective lesson planning and opportunities to develop best practices to better address learners' struggles with mathematics and physical sciences. Teachers were exposed to the diversity of the school-going community and were hence better at classroom management which significantly reduced the learning curve associated with beginner teachers.

The Impact of the After-school Programs

Between the years 2015 and 2017, the After-School Program (ASP) had one level of intervention for learners in addition to the Teacher Mentorship Program, reaching approximately 500 students a week in grades 10-12 and 100 teachers in the TMP. Learners selected on merit from the 20 schools attended STEM enrichment programs in which an e-learning platform was used to supplement the traditional chalk and talk teaching provided in the school and by other NGO's working in the education space in Mamelodi. Although the Mamelodi mathematics and science program had a limited footprint, it had notable qualitative and quantitative achievements.

In partnership with local community projects such as Kutlwanong, the reach of the ASPs in the Mamelodi community learners expanded. Awareness campaigns like the Career Fair hosted on the Mamelodi Campus of the University of Pretoria contributed to learners' exposure to the possibilities within the University of Pretoria. This led to an increased awareness towards higher education access, more so towards enrollment in the University of Pretoria as a result of exposure and access to higher education premises. It was vital that the learners' progress was tracked through the collection of learners' quarterly school report cards so as to ensure that learners benefitted positively from the programs through an evaluation and reflection on the teaching and learning methods in the programs.

A comparative evaluation of the mathematics and physical science marks of the 2018 cohort indicated that the learners that enrolled in the ASPs performed above the national average. In mathematics, 48% received symbols higher than a level four (50-59%) while 22% attained over 70% (level 6 – 7). Nationally, only 10% of learners obtained more than 50% in mathematics. in physical sciences, 53% of the ASP learners obtained over 50% and 29% of them over 80%. Nationally, only 12.5% of learners obtained more than 50% while 14% of the learners achieved level seven. One ASP learner achieved an exceptional 98% in Mathematics and 100% in Physical Science. In 2014, an average of 20% of the grade 12 learners in the program registered at the University of Pretoria. In the following year this number almost doubled to 33%. This trend continued, with 44% of the cohort of 2016 qualifying to enter UP (Bureau for Institutional Research and Planning, 2017).

Figures 1 and 2 below compares the symbol or grade distribution in mathematics and science for the cohorts of 2016, 2017, and 2018. The data shows that the 2018 cohort performed significantly better than the 2016 and 2017 cohorts which validated the improvements that were brought about by partnering with various role-players for a more holistic approach.
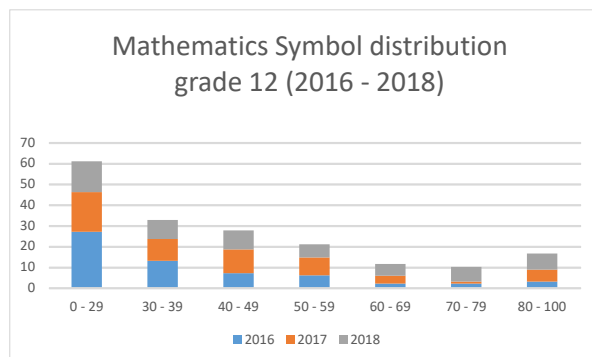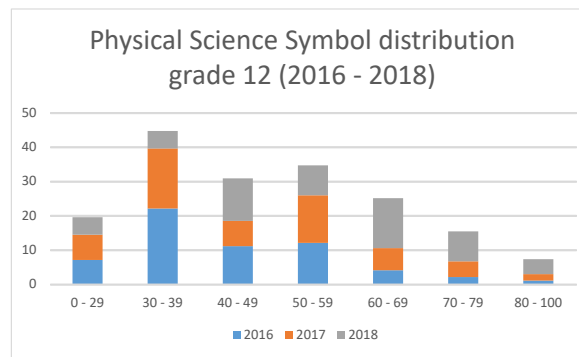

Figure 1 mathematics symbol distribution

Figure 2 physical science symbol distribution

Towards the end of 2018, learners completed a survey from which we gathered that 79 out of a 121 participants, 65%, received provisional acceptance from a university. It is difficult to obtain accurate figures for actual registrations post completing secondary school, since we only had access to the database of the University of Pretoria. Of the candidates registered at the University of Pretoria, approximately 20% enrolled in the following programs: financial services, engineering, the built environment, medical sciences and BSC.

Twelve students that commenced their studies in the ASP and qualified to go into the degree programs at the University of Pretoria underwent semi-structured interviews on their experiences in the program. The interviews were transcribed and subjected to thematic analysis. Two themes emerged from the data analysis namely, aspiration for further studies and academic benefits of the ASP. Extracts from the qualitative data have been provided as examples of learner responses to the interview questions.

Aspiration for further studies and motivational attendance/parental support

> *My Dad even when he was chilling told everyone at home I was attending the University of Pretoria though I was in Grade 10. I had no chance of failing. He would look at my marks and say how I will tell people you had a bad mark. You cannot afford to get a mark lower than 80%.* (Student 3 TM – 2nd year Medical Student)

> *My Mom never went to University so she wanted one of us to go there.* (Student 4 YM)

> *I came for friends, food, education, and that feeling of being at University* (Student 1: NP, now 2nd year Engineering)

Academic Benefits of the After-school Program

> *I think when you come here* (ASP) *and you are behind at school; you learn. By the time they do the work at school you already know the topic.* (Student 5 SM)

> *I met other top learners from other schools, we share information and past papers, we formed a network. We improved our communication skills in front of strangers, learners came from different schools and this helped us not to get into cultural shock at University.* (WS)

> *Online programs like MoMaths, quizzes, computer literacy was an advantage.* (TM)

The incorporation of the ASPs towards redress in the Mamelodi community showed prominence in the Academic Preparedness and College and Career Readiness element of the program's model. The students interviewed identified skills which the programs developed in them which they identify as life-long skills such as communication, information, and thinking skills were among the frequently mentioned. According to the student feedback, the programs enhanced their discipline knowledge and made it easily transmittable to their respective study fields towards a smooth high school-university transition. Such are skills and attributes which the ASPs hoped to develop in ASP learners and thus promote academic readiness and success and have successfully done so.

Emergence of the University of Pretoria Pre-University Academy

Following several improvements between 2013 and 2018, the after-school programs offered on the Mamelodi campus now include those offered by the university itself as well as external partners working in the Mamelodi educational ecosystem. In 2019 the campus initiated the Mamelodi Pre-University Academy (PUA), which houses all the pre-university programs hosted by itself and other partners on the campus premises. Through the PUA the campus is able to follow a multi-stakeholder approach to extend its reach from the initial 500 beneficiaries to 30,000 youth in Mamelodi. The PUA is a signature initiative of the Mamelodi campus which is geared toward fostering articulation between the school level initiatives, ECPs and the mainstream programs to ensure a seamless transition from secondary school to graduation. The PUA has identified three research focus areas as its core business, focusing on college readiness and awareness, teacher professional development, and engendering scientific literary and an interest in science. The first focus area of the PUA is two-pronged to cater for the initiatives designed to foster post-secondary school awareness and readiness. The PUA ensures that the university strategic goals of access and success and social responsiveness and impact are aligned with the anchor mission strategy, the Mamelodi Collaborative.

University of Pretoria's anchor strategy

An assessment of the ASPs offered by the campus during the conceptualization of the campus' anchor strategy identified several strengths and weaknesses which informed the redesign of the ASPs into the PUA. The following strengths were identified:

- Multi-level intervention through structured Memoranda of understanding with the different partners such as private business, non-government organizations (NGOs).
- The collaboration with the Gauteng Department of Education (GDE) in both the learner and teacher program with both parties, UP and GDE, gaining from the partnership with the shared goals of improving student outcomes and pecoordinated coordinated approach including the principals, parents, and learners.
- Implementation of a group mentor program for the learners. The mentors are former Mamelodi Mathematics and Science Program (MMSP) learners that are studying at the University of Pretoria.
- The success of the model for ECPs as a Gateway to Science Technology, Engineering, and Mathematics (STEM) and other careers at the university.
- Possible further leveraging of funds from other sources including international funders.
- The creation of a bursary fund by the Alumni of UP who started their careers at the UP Mamelodi Campus.
- International collaboration with Rutgers University-Newark and the sharing of methodologies.

Similarly, challenges identified were as follows:

- The lack of a rigorous data-led approach to pre-university provisioning to determine the efficacy of the programs and to track student progression from high school through tertiary studies at the different institutional types, ranging from universities, universities of technology (UoTs) or technical and vocational education and training (TVET) colleges.
- The lack of a structured research program or agenda that can enable the university to measure the impact of the programs on student success.
- The lack of articulation agreements with partner institutions of higher learning

To strengthen efforts towards broadening educational pathways for post-secondary school attainment, the campus set out to address the above weaknesses while leveraging on the strengths and the university's infrastructure, capacities, and networks (both internal and external) to build strong educational pathways from early childhood development centers to high school. The campus identified four education networks, the early childhood development (ECD), primary

schools, high schools, and university education networks. The networks address access to quality early childhood education on the one end, and access to tertiary opportunities on the other through targeted community-based projects.

A Data-led Approach: The Mamelodi Community of Learning Collaborative (MCLC)

By the end of 2018, stakeholder participation has increased from the initial five partners that came together in 2015, to more than 20 external stakeholders and six faculties, as well as a number of undergraduate and postgraduate student organizations. In February 2019 the MCLC was established, building on the lessons and experiences of our international partner Rutgers Newark's City of Learning Collaborative (NCLC). The MCLC is a multi-stakeholder partnership between the University of Pretoria, Mamelodi Campus and the GDE's Tshwane South District, Technical, and Vocational Education and Training Colleges, and non-government organizations involved in youth development and the business sector. The aim of this partnership is to address pipeline problems within the educational system and to foster a post-secondary school-going culture in the Mamelodi Township and surrounding areas. The partnership has been formalized to enable a multi-stakeholder provisioning towards strengthening and broadening educational pathways in all four education networks under the rubric of the MCLC.

Partnership with the key role players enables UP, Mamelodi Campus to consolidate its collaboration with the Gauteng Department of Basic Education's Tshwane South District and a network of stakeholders to achieve the goal of broadening educational pathways by using a data-led approach to monitor and measure the impact of all the interventions provided by itself and the MCLC partners. Work on a data clearing house has already commenced. This work entails exploring establishing a link between the data analytics platform of the Department of Basic Education, SA-SAMS to the UP data platforms. Should this be successful, the database will track students from entry into high school right up to the workplace. The campus also envisages extending the mainstream student success initiatives to the ECPs by developing a data-led at-risk student identification and referral system.

Conclusion

Previously the ECPs and ASPs offered on the Mamelodi Campus primarily focused on achieving the access and success strategic goal of the UP. Adoption of an anchor institution strategy broadens the community engagement mandate to broadening educational pathways to postsecondary school attainment and thus achieving not only access but also its social responsiveness mandate through providing access to various institutions of higher learning as well as fostering a college going culture in Mamelodi. The alignment of the access and success and the social responsiveness goals of the university with its anchor strategy through the

Mamelodi Collaborative incorporating a Pre-University Academy is a major achievement for the role of the university in the community.

In ensuring that that the anchor mission is sustainable through the MCLC, which is underpinned by measurement and tracking of the impact of partnerships in community engagement, the university can track the outcomes of the community programs and outreach. Data collection, measurement, and evaluation of partnerships and programs are of high importance in the anchor institution partnerships (Provinzano, Riley, Levine & Grant, 2018). The literature and the work presented in this paper served to highlight the need for more research and more rigorous research methodologies into the impact of anchor mission strategies, more so in the South African context. To address this need the Mamelodi Campus in partnership with Rutgers University - Newark has developed a more deliberate research agenda, which will entail formulating research projects with methodological rigor around the anchor institution strategy of Mamelodi Campus. To this end a research unit, Unit of Access and Success for Students in Transition (UASST) is in the process of being established. The unit will support all inter, multi, and transdisciplinary research related to the anchor mission of the campus. Continued tracking and report of the PUA and MCLC in subsequent studies is therefore of vital importance.

References

Akor, E.U. (2008). *Government intervention in higher education in South Africa; Policy options*. Pretoria: University of Pretoria. DOI: http://hdl.handle.net/2263/29793

Bank, L. (2018). Approaches to the university, place and development. In L. Bank, N. Cloete & F. van Schalkwyk (Eds.), *Anchored in Place: Rethinking higher education and development in South Africa* (pp. 1 – 22). Cape Town, South Africa: African Minds.

Bergen, D. J., & Sladeck, E. (2019). Considering the anchor mission strategy within the competing "regimes" of higher education community engagement. *Metropolitan Universities*, *30*(1), 69-74. 10.18060/22917

Birch, E., Perry, D. C., & Taylor, H. L. (2013). Universities as Anchor Institutions. *Journal of Higher Education Outreach and Engagement*, *17*(3), 8-15.

Bureau for Institutional Research and Planning. (2017). *Quality enhancement project: Institutional feedback*. Pretoria: University of Pretoria.

Cantor, N., Englot, P., & Higgins, M. (2013). Making the work of anchor institutions stick: building coalitions and collective expertise. *Journal of Higher Education and Engagement*, *17*(3), 17-46.

Case, J.., Marshall, D., & Grayson, D. (2013). Mind the gap: Science and engineering education at the secondary-tertiary interface. *South African Journal of Science, 109*(7-8), 1-5. http://dx.doi.org/10.1590/sajs.2013/20120113

Department: Statistics South Africa. (2015, January 28). *Census 2011*. Retrieved from Stats SA: http://www.statssa.gov.za/?page_id=3839

Dragicevic, N. (2015). *Anchor Institutions*. Toronto: Atkinson Foundation.

Ehlenz, M. M. (2016). Neighborhood revitalization and the anchor institution: assessing the impact of the University of Pennsylvania's west Philadelphia initiatives on University City. *Urban Affairs Review, 52*(5), 714-750. https://doi.org/10.1177%2F1078087415601220

Ehlenz, M. M. (2018). Defining university anchor institution strategies: Comparing theory to practice. *Planning Theory and Practice, 19*(1), 74-92. https://doi.org/10.1080/14649357.2017.1406980

Ehlenz, M. M. (2018, November 27). The university and its neighborhood: a study of place-making and change. *Urban Affairs*, 1-19. DOI:10.1080/07352166.2018.1530568

Engelbrecht, J., Harding, A., & Potgieter, M. (2014). Evaluating the success of a science academic development program at a research-intensive university. *African Journal of Research in Mathematics, Science and Technology Education, 18*(3), 287-298. https://doi.org/10.1080/10288457.2014.962726

Fashola, O. S. (1998). *Review of extended-day and after-school programs and their effectiveness*. Baltimore: Center for Research on the Education of Students Placed at Risk.

Friedman, D., Perry, D., & Menendez, C. (2014). *The foundational role of universities as anchor institutions in urban development: A report of national data and survey findings*. The Coalition of Urban Serving Universities. Retrieved from https://usucoalition.org/images/APLU_USU_Foundational_FNLlo.pdf

Hahn, A., Coonerty, C., & Peaslee, L. (2005). *Colleges and universities as anchors: profiles of promising practices. Brandeis University. Baltimore: The Annie E. Casey Foundation.* Retrieved from https://www.aecf.org/resources/colleges-and-universities-as-economic-anchors/

Hendricks, D., & Flaherty, J. (2018). Integrating the edges: University of Pretoria's neighborhood anchor strategy. *Development Southern Africa*, *35*(5), 689-700. https://doi.org/10.1080/0376835X.2018.1433024

Kivunja, C. (2015). Teaching students to learn and to work well with 21st century skills: Unpacking the career and life skills domain of the new learning paradigm. *International Journal of Higher Education*, *4*(1), 81 - 91. URL: http://dx.doi.org/10.5430/ijhe.v4n1p1

Kremer, K. P., Maynard, B. R., Polanin, J. R., Vaughn, M. G. & Sarteschi, C. M. (2015). Effects of after-school programs with at-risk youth on attendance and externalizing behaviors: a systematic review and meta-analysis. *Journal of Youth and Adolescence*, 44, 616 - 636. DOI 10.1007/s10964-014-0226-4

Lauer, P. A., Motoko, A., Wilkerson, S. B., & Apthorp, H. S. (2006). Out-of-School-Time Programs: A Meta-analysis of effects for at-risk students. *Review of Educational Research*, *76* (2), pp. 275–313. https://doi.org/10.3102/00346543076002275

Lemmer, E. M. (2007). Parent involvement in teacher education in South Africa. *International Journal about Parents in Education*, *1*(0), 218-229.

Lester, A. M., Chow, J. C. & Melton, T. N. (2020). Quality is critical for meaningful synthesis of afterschool program effects: a systematic review and meta-analysis. *Journal of Youth and Adolescence*, 49, 369 - 382. https://doi.org/10.1007/s10964-019-01188-8

Nkoana, E. M. & Dichaba, M. M. (2017). Development and application of conceptual and analytic frameworks for community engagement at a South African higher education

institution. *South African Journal of Higher Education*, 31(6), 177 - 196. http://dx.doi.org/10.28535/31-6-1574.

Norris, K. & Weiss, H. A. (2019). Building capacity as anchor institutions: infrastructure, structure, and strategy. *Metropolitan Universities Journal*, 30 (1), 51 - 68. DOI: 10.18060/22372

Ogude, N. A., Meyer, I. J., Mwambakana, J., & Mthethwa, N. E. (2019). Can extended curriculum programs be improved through engagement with students using appreciative inquiry? *South African Journal of Higher Education*, *33*(4), 219-236. http://dx.doi.org/10.20853/33-4-2835

Provinzano, K., Riley, R., Levine, B., & Grant, A. (2018). Community schools and the role of university-school-community collaboration. *Metropolitan Universities, 29*(2), 91-103. DOI: 10.18060/21762

Snilstveit, B., Stevenson, J., Menon, R., Phillips, D., Gallagher, E., Geleen, M., Jimenez, E. (2016). *The impact of education programs on learning and school participation in low- and middle-income countries.* Retrieved from http://repositorio.minedu.gob.pe/handle/123456789/4892.

Smith, J., Pelco, L. E., & Rooke, A. (2017). The emerging role of universities in collective impact initiatives for community benefit. *Metropolitan Universities, 28*(4), 9-30. https://doi.org/10.18060/21743

State of the Nation. (2019). *Poverty and inequality: Diagnosis, Prognosis, response*. Cape Town: Human Sciences Research Council Press.

Strydom, B. (2016). South African University history: a historiographical overview. *African Historical Review*, *48*(1), 56-82. https://doi.org/10.1080/17532523.2016.1236886