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Understanding the Academic Journey of an International West African Engineering Graduate Student in the United States

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STUDENT PAPER
Work-In-Progress: Understanding the Academic Journey of an International West African Engineering Graduate Student in the United States

Abstract

International graduate students contribute significantly to the United States (U.S.) engineering academic and professional workforce. These students bring to the U.S. extensive knowledge from their home countries, strengthen diversity, classroom internationalization, and multicultural education (among the student body, faculty members, and staff in the U.S. universities), acquire world-class knowledge, and benefit the global economy by way of engineering contributions. However, graduate students from Sub-Saharan Africa (SSA) are generally understudied within the broader population of international engineering students. This is noteworthy because individuals from SSA have among the highest rates of degree attainment, specifically in engineering and other STEM fields. Students from some West African countries like Nigeria have among the highest levels of educational training of SSA students and Black populations more broadly.

Expanding research on Black students from West Africa (WAFR) (a region within SSA) is particularly important since not all Black students are the same. This work responds to a growing call for more intra-study research within diverse groups that have historically been treated as homogeneous. As such, this study intends to illuminate their educational experiences before and after transitioning to the U.S. in engineering disciplines using a narrative inquiry approach. This work-in-progress begins this larger study by focusing on one student's ("Apex," pseudonym) experiences in two contexts: (Nigeria, his country of origin and undergraduate study, and the U.S., where he transitioned for his Doctor of Philosophy [PhD]). Apex's educational experiences in engineering and the strategies he employed to navigate his transitioning will be documented through his narrative. Data will be derived from Apex's life and educational experiences in engineering before, during, and after he transitions to the U.S. from Nigeria.

Results from this study will advance the literature by providing education researchers and practitioners with a novel and innovative understanding of Nigerian engineering students' (NES) experiences. It will advance knowledge of Nigerian undergraduate engineering programs and their benefits to international engineering graduate students. Ultimately, the findings will help inform practices within engineering programs to better support potential graduate students in making similar transitions and broaden the participation of African diasporic engineering students in the U.S.

Keywords: Black students, foreign-born, graduate students, international students, West African, engineering, academic experiences.

1. Introduction

Sub-Saharan Africa (SSA), African American, Afro-Latino, Caribbean, etc., represent region-specific and different groups of Blacks with ethnically diverse cultures and experiences. Despite the SSA students being among the least-represented international student groups in the U.S. [1], they represent the fastest-growing and highest-educated among Blacks in the U.S. [2]. According to the Migration Policy Institute [2], more than 64% of SSA Blacks have college degrees or

degrees in STEM majors. Despite their accomplishments, this population is understudied in engineering education literature. In-particular, Blacks born in West Africa (WAFR), who are the most represented and include Nigerians (the highest educated WAFR/SSA group in the U.S. [1]) are generally not the focus of research on engineering education studies. As shown in the literature review, the scholarship that focused on WAFR engineering students studied their graduate experiences in the U.S., without considerable attention to their undergraduate academic journeys obtained in their home countries. Finally, published articles frequently focus on WAFR and other SSA students who have attended well-resourced schools, come from middle to upper-income families, and were raised by educated parents [3], [4].

This broader work seeks to fill these lacunae and to respond to the calls to explore intragroup differences amongst Black populations that have historically been treated as homogeneous [5], [6] and excluded. By centering the focus on WAFR engineering students, and in particular a Nigerian engineering student from a lower-income family and raised by unschooled parents, we extend the literature on Black engineering students in a new and important direction. This work-in-progress seeks to understand the experiences of one lower-income student who earned an undergraduate engineering degree in his home country (Nigeria), from a Nigerian publicly funded university and then transitioned to the U.S. for his Doctor of Philosophy (PhD) in engineering. Just as other international students, Black students from WAFR who transition to the U.S. educational system, may be vulnerable and exposed to a unique cultural shift in their educational trajectory [7]–[9]. As such, this work intends to bring one unique Nigerian engineering educational experience, both before and after transitioning to the U.S., to bear within engineering education research.

2. Literature Review

2.1 Nigerian Engineering Students

In this study, "Nigerian engineering students" refers to individuals who are born and educated (in engineering up to and including the undergraduate degree) in Nigeria and then transition into an engineering graduate school in the U.S. Scholarship on international graduate students in the U.S often do not focus on undergraduate experiences earned in students' home countries. Across the spectrum of studies on Black engineering students [5], [10]–[15] in the U.S., research has generally not explored the undergraduate experiences of foreign-born Blacks in their home countries. Given the considerable intellectual capital that WAFR engineering students, and particularly Nigerian engineering students, bring to the U.S., and their contributions to the workforce [16], further study of their academic pathways (before and after transitioning to the U.S.) is valuable.

Out of the four SSA regions- Central Africa, East Africa, Southern Africa, and WAFR [17], WAFR countries (especially Nigeria and Ghana) continue to supply the U.S. with the highest number of international students [1]. Nigerian students are educated in the English language medium throughout their k-16 education in Nigeria [18]. These students have been recognized as having the highest levels of educational training of all SSA-born student populations in the U.S. [2]. Notably, 64% of all Nigerian immigrants in the U.S. hold at least a bachelor's degree [2], and many of these degrees are in STEM fields [1]. The Nigerian student population in the U.S. increased by 12.3% in the 2021-22 academic year. Among the top 25 countries globally that send students to the U.S., Nigeria has ranked in the top 15 sending countries since 2014-15 and has

remained the only SSA country consistently listed in the top 15 since the 2010-11 academic year [1]. Notably, the Nigerian student's enrollment into the U.S. graduate academic level records the highest (more than 18,000 students) across three consecutive academic cycles (2019-20, 2020-21, and 2021-22), and in comparison, to other academic levels (e.g., non-degree, undergraduate) [1].

2.1.1 Engineering Students' Experiences in Nigeria

In a typical public university in Nigeria, the student-to-teacher ratio is very high [19]. With more engineering students, and fewer engineering faculty members, Nigerian engineering students (especially those in a non-private institutions) attend overcrowded classes [20], that are mostly not technologically supported to enhance learning. As such, the students may have to: 1) get to the class earlier (to secure a good sitting spot), 2) shun the noises and be highly attentive to the lecture, 3) seek a tutoring time (often conducted by a senior student who has previously done the class before and more knowledgeable), 4) join smaller study group (organized by co-students, religious groups, or private tutors), 5) personally prepare (i.e., self-study) by consulting further resources. Overall, these unique situations, prepare the Nigerian engineering students to keep pushing through.

In their respective engineering departments, the students may only have access to aging or obsolete engineering equipment and sometimes may lack the needed equipment and infrastructure due to paucity of funding [19]–[21]. Even for the available ones, the students may have limited access to them and restrictive usage. As a result, the students experience practical deficiency. However, their 'no-excuse' attitude makes many of them to be vaster in engineering theory. Although, some would argue that despite these challenges, Nigerians, especially, those studying for a graduate degree outside their home country after obtaining their first degree in Nigeria are still performing well [21]. Thus, it is important to understand these students' experiences, particularly in their graduate school engineering trajectory in the U.S., which may be fully informed by their bachelor's engineering degree experiences obtained in Nigeria.

2.2 Emphasis on Black Students in the U.S.

Scholarship on the educational experiences of Black students in the U.S. often generalize all Black people from different groups, African, African American, Afro-Latino, Caribbean, etc., as homogeneous, and often do not differentiate between people of the same race (e.g., Black) and their ethnicity (e.g., African culture) [22]–[25]. Some scholarship differentiates foreign-born Black individuals (e.g., Trinidad and Tobago, Caribbean, Senegal, Ghana, Nigeria, Haiti, etc.) from other Black people who are native-born or African American [5], [11], [13], [14], [26]. There is considerable diversity in the overall Black population owing to nationality/ethnicity which implies that all Black students have varying experiences [26], [27]. As such, institutional, state, or federal research and policies centered on Black students should be disaggregated to accommodate different Black populations.

There is indeed a growing body of literature on foreign-born (self-identified as Caribbean, Nigerian, Jamaican, Ghanaian, Ethiopian, Togolese, etc.) Black students' experiences in engineering graduate programs in the U.S. [5], [12], [13]. However, in these studies, the research participants (RPs) had their undergraduate engineering degrees from a U.S.-based institution. Blacks born and educated through their bachelor's degree in a WAFR country to adulthood have distinctive cultural experiences, unique educational exposure, and specific identities that are

underrepresented in the research literature. It is evident that the Black population is diversified [28], [29] and there is ample reason to suspect that these set of foreign-born Blacks may command different/similar place-based undergraduate engineering experiences that shape their graduate degree in engineering in the U.S. Hence this work intends to contribute to the growing body of literature by examining and bringing to the forefront Nigerian engineering students' experiences in engineering education research.

2.2.1 Research that explores the diversity of Black students' experiences in Post-Secondary Education in the U.S.

Certain factors (e.g., stereotypes, economic hardships, language adaptations, accent, finances, culture, etc.) have been found to either positively motivate or negatively impact Black student's academic experiences [7], [23], [26], [30]–[32]. Research has found that culture is one key factor that informs foreign-born Black students' academic experiences [31], [33], [34]. Furthermore, it has been asserted that faculty professional development should be aimed so that faculty can utilize culturally relevant environments and pedagogies as assets [35], [36] particularly since foreign-born Black students have used cultural responses to inform their educational experiences in navigating challenges [26], [37]. Foreign-born Black students sense a cultural difference from their native-born counterparts [26], [38], and it is pertinent to have a clearer picture of this distinction [39]. Some foreign-born Black students in engineering graduate programs in the U.S. have found themselves negotiating to "understand and adapt to the native-born Black/African American culture," "adopt the native-born Black/African American culture," or "preserve their own culture" [5]. These negotiations of Blackness confirm differences among African diasporic students. As such, it is important to understand how Black engineering students from Nigeria (with a short period spent in the U.S.) use their cultural assets to negotiate within the cultural environment of graduate school, including negotiating their Black identities.

At the college/university level, themes such as racial identity, socialization, etc., are gaining more ground in terms of their impact on Black students' experiences [26], [40]–[42]. Racialization experienced by foreign-born students in the U.S. may hurt their academic trajectory which includes socialization and personal well-being [43]. For example, in one study, eight of the nine RPs that identified as foreign-born Blacks highlighted how racialization negatively impacts their engineering graduate experiences in the U.S. [5]. In their home country, these foreign-born Black students have little to no experience with or understanding U.S. racialization [26]. There is a stark difference between the racialization of an African American who has been educated entirely in the U.S. and a Black individual from a WAFR country such as Nigeria, the largest Black nation on earth [44], whose entire k-16 education was shared with other Black Nigerians before entering graduate school in the U.S. As such, the Nigerian engineering students' graduate school experiences after transitioning may be informed by new encounters, including within-group racial experiences.

2.3 Black engineering students navigating approach in the U.S.

Broadly considering the experiences of Black students in engineering, research has highlighted the need for educational institutions to foster better environments for Black students more generally. For example, 16 Black engineering students who completed their four-year institution in a PWI and HBCU and enrolled in an engineering graduate program, recommended the need for institutions to foster an inclusive academic engineering environment for Black students [14]. In a qualitative study that explored the experiences of 30 Black students in engineering graduate

program at three PWIs, 29 of them attended a U.S. four-year degree institution, and they shared their experiences on how existing strengths (such as family role, spirituality, the faith-based community, and undergraduate mentors) helped them to persevere through their graduate studies [13]. Determination and persistence were two key elements that informed the experiences of Black students for them to circumvent institutional challenges in the U.S. [12]. Familial expectations, as well as friends and family support networks, have been found to uphold the persistence and success of Black students [6], [40], [43], [45], [46]. Emotional support, a powerful non-academic resource provided by Black students' relatives was found to help them persist through [6]. Overall, some Black students have employed different means to compel and overcome several challenges.

Collectively, the perspective gained from this work will help to better understand how the experiences of Nigerian engineering students may be similar or different from those (Black students) previously researched in the literature. Furthermore, how these Nigerian engineering students leverage their unique cultural knowledge and navigate new experiences of racialization within engineering communities in ways that may impact their educational graduate experiences will be explored. Given the understudied nature of this work, we focus on expounding on and highlighting the experiences of one unique Nigerian engineering student through an in-depth narrative inquiry. Scholarly attention to a "small n size" unique story amasses greater account [47]. This will give voice to previously unheard experiences and lay a theoretical foundation for future work focusing on WAFR engineering students in engineering.

3. Theoretical Framework and Research Questions

Community Cultural Wealth (CCW) theory helps to recognize and single out the support (cultural resources) emanating from students of color villages (e.g., families and communities) [13], that they carry on with them into the education environment [48]. This carry-on cultural wealth and resources are assets that are cultivated, exhibited, and represent different types of dynamic capital [49]. Communities of color in the U.S. possesses capitals (i.e., assets, knowledge, contacts) that may not be well valued and recognized but applied to subsist. In this work, CCW is utilized to guide the research design for understanding the experiences of Nigerian engineering students in their engineering trajectory.

The overarching research question (RQ) for this work is, "How do Nigeria engineering students transition from their local undergraduate engineering degree to a U.S. engineering graduate student?" Sub-RQs that address this community's cultural wealth theoretical framing include: 1) What are the cultural resources and strategies Nigeria engineering students derived from their undergraduate engineering experience in their home countries? 2) How, if at all, did Nigerian engineering students leverage cultural resources and strategies to support their transition into the U.S. engineering graduate school, both in terms of socialization and personal well-being? 3) How do Nigerian engineering students fit into the U.S. engineering environment?

4. Author Positionalities

Through positionality, engineering education researchers explore their beliefs, worldviews, motives, and biases to ensure the authenticity, transparency, and trustworthiness of their work [50], [51]. It is therefore pertinent for researchers to remain transparent and communicate their

positionality and reflexivity [52]. Social position, individualized experiences, beliefs, etc., are some of the basic aspects that a researcher's positionality includes [50], [51].

The first author self-identifies as a unique Nigerian Black male in engineering, with diverse local and international exposure and experiences that have shaped his perceptions of the engineering education discipline. He shares the same blackness, background, and attributes with the research participant (RP), and obtained his bachelor's in WAFR. There exist numerous strengths when the researcher and the RP hold identical positions and stances, and similar identity and language [53]. Thus, the first author is positioned as an insider that the RP will be more comfortable with to share a deepened narrative. These shared identities will allow for a clearer understanding and interpretation of the data. Also, degrees and educational experience earned and obtained in other countries like the U.K., France, and UAE and in both engineering and social science fields will help this work reflexivity and interpretation of data to win over potential biases [54].

The second author self-identifies as a native-born Black/African American and received all his education in the U.S. His research activities explore the experiences of Black students (native and foreign-born) in U.S. community colleges and four-year institutions. Black students from sub-Saharan Africa are important demographics that he often explores in his works.

5. Research Methodology

After the initial conceptualization of the research participant (RP) and the research questions, the narrative inquiry was identified as an appropriate methodological choice [55], owing to the exploration [51] of the RP life. Afterward, the theoretical framing and methodology were utilized to refine the research questions [56]. Narrative research is gradually becoming an approach that engineering education researchers [12], [47] are exploring for small sample size, deeper interrogation, researcher-participant closeness, improved data collection and data analysis, rich insights into larger issues, and theory advancement [57], [58]. Through the chronological connectedness in shaping the story of one RP [51], [58], this exploratory approach [59] will help to generate rich detailed accounts and provide a tool to analyze them and identify specific incidents and tensions (turning points) in them.

Apex spent the first 25 years of his life in Nigeria and earned his 5 years undergraduate degree in engineering there, and an intensive one-year industrial and research-inclined engineering master's degree, before transitioning to the U.S. for PhD in engineering, starting in the fall of 2018. Apex will express his lived/living experiences freely and unconditionally through stories [60], that can convey the intended messages [58], such that stakeholders can fully understand his lived experiences both at home and abroad over time [61]. The narrative inquiry approach has a fluid nature and is flexible, to capture distinct and reflective narratives [59], [62] of the lived and educational experiences [47] of Apex through various data collection methods (e.g., interviews, participant observation, and focus groups), and from that creating experiences for the engineering education community, that is tension-free, calm and relaxing storytelling [58], [63]–[65]. This way, the research team will be able to gather extensive and triangulated data whose constructs, themes, and interpretations [66] situate Apex's life and engineering education experiences.

5.1 Research Methods

An Institutional Review Board (IRB) approval for this work-in-progress was obtained in March 2023. Moving forward, the research team will formally request the participation of the primary research participant (i.e., Apex) and commence the data collection procedure. Having known Apex for more than 8 years, his voice deserved to be heard, and stories and lived experiences shared to broadly impact the engineering education community. The research team and Apex will collectively identify the focus group participants who were among Apex's previous classmates and shared similar social and cultural backgrounds with him. Some of whom have purposefully visited him during his graduate studies. These classmates (24 in number) have a strong relationship circle and a social group meeting platform, thus making recruitment easier.

Apex's selection was based on his unique and compelling story and identity which fit the aim of this work. Among Apex's previous classmates that were competitively selected across WAFR to participate in a sponsored engineering master's program in Nigeria, Apex is/was: 1) a first-generation student, 2) one of the very few that graduated from a state-public funded university, 3) from a low-average class family, 4) that one person that juggles his academics with other external commitments for financial stability, 5) clear on his intention to proceed immediately for his PhD abroad despite job assurance from the program sponsor (Total Energy) and other energy companies (ExxonMobil, Shell, Chevron, etc.). By fully concentrating on Apex, (small "n" size), this work will generate a deepened individualized meaning-making [47], with detailed accounts that are unique (as against brief responses), resulting in an elaborative certainty, and that will help to support future exploration [58], [67], [68].

Data collection for this work will include multiple sources of data including one semi-structured interview, a focus group, a participatory observation, and informal interviews. In the semi-structured interview, we will ask questions that open the conversation and focus the content on Apex's engineering experiences, and the cultural resources and strategies employed to navigate through. For example, "Please kindly share your growing up experience in Nigeria, from childhood up to the completion of high school (i.e., k-12) (Pointers/guides may include family background, cultural beliefs, family source of income, types of the school attended, kind of environment lived in, kind of association involved with, notable opportunities, driving force, etc.)." Apex will have the autonomy to construct his answers through stories in a way he finds meaningful. He won't be interrupted, except when needed as a follow-up or to re-guide him.

The focus group will involve six participants (secondary research participants) and two moderators (members of the research team). As reflection plays a key role in life experiences [62], the focus group participants will be asked to reflect, interact and discuss their opinions and experiences with Apex [63]. Prompts will include "Can you describe your experience with Apex during team projects?" The captured themes from the focused group will partly serve as a form of member checking, that will help Apex to reflect more on "how he is perceived by others," and an in-depth understanding of his storytelling.

The first author will engage in a participatory observation focused on a day in the life of Apex graduate school routine. The aim is to understand beyond a semi-structured interview and focus group, how Apex leverages his personality, cultural resources, and strategies, to fit into the U.S.

engineering environment. Pre, during, and post-observation, there will be informal interviews to (1) bring clarity on the interpretations of the semi-structured interview (2) guide the observer's comment that emerged during observation (3) serve as a form of member checking and triangulation.

We will be using two strategies for the analysis of data. Through a thematic analysis approach, to identify themes, and a dialogic analysis approach on the style in which the story is produced and performed. The research team will be more reflective on the re-storying of Apex's story, and a necessary active collaboration will help to recheck the "re-story" account to ascertain accurate interpretations. This way the research team and Apex will negotiate the story meanings, thus creating an analysis validity check [51], [69].

6. Impact and Implications

Scholars have worked on the experiences of Black students who obtained their STEM degree in a U.S. four-year institution. This project will complement previous scholarship by understanding the experiences of Nigeria engineering students in an all-Black engineering undergraduate degree in Nigeria, and a graduate degree in an HSI in the U.S. Using an asset-based approach, the well-deepened and extensive data obtained from the narrative of Apex will give a sense for understanding Nigeria engineering students' uniqueness and serve as a base and starting point for future exploration on Nigeria engineering students in U.S. engineering graduate schools.

For a good understanding of human experiences, the present learns and infers from the past and resultantly channels the future [70], [71]. Through this work, the engineering education scholarly community will become attuned and knowledgeable of Nigeria engineering students' undergraduate experience in Nigeria, and recognize how their experiences have contributed to their engineering experience in the U.S. By learning from the lived experience (both at home and abroad) of Nigeria engineering students, institutions will have a better understanding of their cultural assets, values and how to utilize them in further supporting their engineering education and profession and broaden potential engineering students transitioning. This work will help to further support Nigerian engineering students to continue to contribute in the short term through their academics and in the long term, through their professions to global knowledge. Those who return periodically or permanently to their home country will help to create a direct and sustained impact by utilizing their gained skills.

7. Conclusion

Global problems and knowledge transcend borders of culture and require a diverse and interconnected world [72]. Indeed, the continuous integration and inclusion of Nigerian engineering students into the U.S. engineering graduate school and workforce will contribute to U.S. diversity and global competitiveness [73]. Understanding the experiences of these Nigeria engineering students who enculturate a dominant, diverse, and Black culture and utilizing them to navigate their non-dominant acculturating environment in the United States will promote an intra-study of Black students in the U.S and a valid recognition of the diversity among Blacks.

References

[1] Institute of International Education (IIE, 2022), "International Student Data, Open Doors Report," 1948/49-2021/22. Accessed: Jan. 17, 2022. [Online]. Available: https://opendoorsdata.org/

[2] Jane Lorenzi and Jeanne Batalova, "Sub-Saharan African immigrants in the United States," Migration Information Source, Oct. 2022. [Online]. Available: https://www.migrationpolicy.org/article/sub-saharan-african-immigrants-united-states-2019#age-education-employment

[3] F. J. Onuma, "DOES SOCIAL CLASS HAVE ANYTHING TO DO WITH IT?: EXPLORING THE COLLEGE DESTINATION PROCESS OF NIGERIAN IMMIGRANT-ORIGIN STUDENTS ATTENDING PRIVATE ELITE COLLEGES AND UNIVERSITIES," 2021, doi: 10.13016/ZEGC-2I9Y.

[4] Griffin, A. A., Scholar, M., and Griffin, K. A., "'For me, it was just routine:' Exploring Factors Related to Post-Secondary Aspirations for African Immigrants.," *Penn State McNair J.*, vol. 67, 2010.

[5] B. A. Burt, A. Knight, and J. Roberson, "Racializing experiences of foreign-born and ethnically diverse Black male engineering graduate students: Implications for student affairs practice, policy, and research," *J. Int. Stud.*, vol. 7, no. 4, pp. 925–943, 2017.

[6] F. J. Onuma and B. T. Berhane, "The Role of Family in the Educational Careers of Black Engineering Alumni," *J. Women Minor. Sci. Eng.*, vol. 27, no. 5, 2021.

[7] M. Sherry, P. Thomas, and W. H. Chui, "International students: A vulnerable student population," *High. Educ.*, vol. 60, no. 1, pp. 33–46, 2010.

[8] M. S. Andrade, "International students in English-speaking universities: Adjustment factors," *J. Res. Int. Educ.*, vol. 5, no. 2, pp. 131–154, Aug. 2006, doi: 10.1177/1475240906065589.

[9] C. W. Yao, "Unfulfilled expectations: Influence of Chinese international students' roommate relationships on sense of belonging," *J. Int. Stud.*, vol. 6, no. 3, pp. 762–778, 2016.

[10] E. O. McGee, "Devalued Black and Latino racial identities: A by-product of STEM college culture?," *Am. Educ. Res. J.*, vol. 53, no. 6, pp. 1626–1662, 2016.

[11] D. R. Brooms, "Not in this alone: Black men's bonding, learning, and sense of belonging in Black male initiative programs," *Urban Rev.*, vol. 51, no. 5, pp. 748–767, 2019.

[12] V. B. Sellers, J. P. Martin, and M. Seraphin, "A narrative inquiry approach to community cultural wealth of Black men in engineering," *J. Women Minor. Sci. Eng.*, vol. 28, no. 4, 2022.

[13] B. A. Burt, K. L. Williams, and G. J. Palmer, "It takes a village: The role of emic and etic adaptive strengths in the persistence of Black men in engineering graduate programs," *Am. Educ. Res. J.*, vol. 56, no. 1, pp. 39–74, 2019.

[14] K. Thomas, M. L. Greene, B. C. Coley, D. Maitra, J. M. Brisbane, and J. S. London, "For Us, By Us: Recommendations for Institutional Efforts to Enhance the Black Student Experience in

Engineering," presented at the 2022 CoNECD (Collaborative Network for Engineering & Computing Diversity), 2022.

[15] B. Berhane, S. Hayes, D. Koonce, and C. Salley, "On transfer student success: Exploring the academic trajectories of black transfer engineering students from community colleges," presented at the ASEE Annual Conference proceedings, 2019.

[16] S. J. Gold, "International students in the United States," *Society*, vol. 53, no. 5, pp. 523–530, 2016.

[17] United Nations, "World population prospects 2022." Accessed: Nov. 12, 2022. [Online]. Available: https://population.un.org/wpp/

[18] U. Gut, "Standards of English in West Africa," 2010, pp. 213–228.

[19] A. A. Akintola, G. A. Aderounmu, and O. K. Owolarafe, "Problems of engineering education and training in developing countries: Nigeria as a case study," *Eur. J. Eng. Educ.*, vol. 27, no. 4, pp. 393–400, Dec. 2002, doi: 10.1080/03043790210166693.

[20] G. M. Bubou, I. T. Offor, and S. Gumus, "An argument for the practice of evidence-based teaching in engineering education for developing countries with focus on Nigerian universities," in *Engineering Leaders Conference 2014 on Engineering Education*, Doha, Qatar,: Hamad bin Khalifa University Press (HBKU Press), 2015. doi: 10.5339/qproc.2015.elc2014.26.

[21] A. A. Oloyede, H. A. Ajimotokan, and N. Faruk, "Embracing the future of engineering education in Nigeria: teaching and learning challenges," *Niger. J. Technol.*, vol. 36, no. 4, p. 991, Jan. 2018, doi: 10.4314/njt.v36i4.1.

[22] M. D. Barnett, G. Sonnert, and P. M. Sadler, "More like us: The effect of immigrant generation on college success in mathematics," *Int. Migr. Rev.*, vol. 46, no. 4, pp. 891–918, 2012.

[23] E. Calzada *et al.*, "Early academic achievement among American low-income Black students from immigrant and non-immigrant families," *Prev. Sci.*, vol. 16, no. 8, pp. 1159–1168, 2015.

[24] N. Foner, *Islands in the city: West Indian migration to New York*. Univ of California Press, 2001.

[25] J. E. Glick and B. Hohmann-Marriott, "Academic performance of young children in immigrant families: The significance of race, ethnicity, and national origins," *Int. Migr. Rev.*, vol. 41, no. 2, pp. 371–402, 2007.

[26] C. A. G. Mwangi and S. Fries–Britt, "Black within Black: The perceptions of Black immigrant collegians and their US college experience," *Campus*, vol. 20, no. 2, pp. 16–23, 2015.

[27] C. A. G. Mwangi and S. English, "Being Black (and) immigrant students: When race, ethnicity, and nativity collide," *Int. J. Multicult. Educ.*, vol. 19, no. 2, pp. 100–130, 2017.

[28] K. Brown, "Now is the Appropriate Time for Selective Higher Education Programs to Collect Racial and Ethnic Data on Its Black Applicants and Students," *Thurgood Marshall Law Rev.*, vol. 34, no. 2, pp. 287–322, 2009 2008.

[29] D. S. Massey, M. Mooney, K. C. Torres, and C. Z. Charles, “Black Immigrants and Black Natives Attending Selective Colleges and Universities in the United States,” *Am. J. Educ.*, vol. 113, no. 2, pp. 243–271, Feb. 2007, doi: 10.1086/510167.

[30] C. Kristen, “Language assimilation and the education of immigrant students,” in *Research Handbook on the Sociology of Education*, Edward Elgar Publishing, 2019.

[31] A. Kumi-Yeboah, A. C. Onyewuenyi, and P. Smith, “Teaching black immigrant students in urban schools: Teacher and peer relationships and academic performances,” *Urban Rev.*, vol. 53, no. 2, pp. 218–242, 2021.

[32] R. L. Traoré, “Colonialism continued: African students in an urban high school in America,” *J. Black Stud.*, vol. 34, no. 3, pp. 348–369, 2004.

[33] P. R. Bennett and A. Lutz, “How African American is the net black advantage? Differences in college attendance among immigrant blacks, native blacks, and whites,” *Sociol. Educ.*, vol. 82, no. 1, pp. 70–100, 2009.

[34] W. C. Byrd, R. J. Brunn-Bevel, and P. R. Sexton, “‘WE DON’T ALL LOOK ALIKE’: The Academic Performance of Black Student Populations at Elite Colleges1,” *Bois Rev. Soc. Sci. Res. Race*, vol. 11, no. 2, pp. 353–385, 2014.

[35] J. Awokoya, “Identity constructions and negotiations among 1.5-and second-generation Nigerians: The impact of family, school, and peer contexts,” *Harv. Educ. Rev.*, vol. 82, no. 2, pp. 255–281, 2012.

[36] A. W. Cherry, “Spaces of possibilities: Using diaspora as a tool to unravel complex ideological frameworks that impact diasporic encounters among African Americans, Afro-Latinas/os, and Latinas/os of African Descent in a Prince George’s County, Maryland public middle school,” *Transform. Anthropol.*, vol. 23, no. 1, pp. 28–42, 2015.

[37] S. Fries-Britt, C. A. George Mwangi, and A. M. Peralta, “Learning race in a US Context: An emergent framework on the perceptions of race among foreign-born students of color,” *J. Divers. High. Educ.*, vol. 7, no. 1, p. 1, 2014.

[38] C. A. George Mwangi, S. Fries-Britt, A. M. Peralta, and N. Daoud, “Examining intraracial dynamics and engagement between native-born and foreign-born Black collegians in STEM,” *J. Black Stud.*, vol. 47, no. 7, pp. 773–794, 2016.

[39] K. A. Griffin, E. L. Cunningham, and C. A. George Mwangi, “Defining diversity: Ethnic differences in Black students’ perceptions of racial climate,” *J. Divers. High. Educ.*, vol. 9, no. 1, p. 34, 2016.

[40] M. G. Constantine, G. M. Anderson, L. A. Berkel, L. D. Caldwell, and S. O. Utsey, “Examining the cultural adjustment experiences of African international college students: A qualitative analysis,” *J. Couns. Psychol.*, vol. 52, no. 1, p. 57, 2005.

[41] L. I. Hypolite, “‘It just helps to know that there are people who share your experience’: Exploring Racial Identity Development Through a Black Cultural Center,” *J. Negro Educ.*, vol. 89, no. 3, pp. 233–248, 2020.

[42] M. G. Knight, R. Roegman, and L. Edstrom, “My American Dream:The Interplay Between Structure and Agency in West African Immigrants’ Educational Experiences in the United States,” *Educ. Urban Soc.*, vol. 48, no. 9, pp. 827–851, 2016, doi: 10.1177/0013124515589596.

[43] J. J. Lee and C. Rice, “Welcome to America? International Student Perceptions of Discrimination,” *High. Educ.*, vol. 53, no. 3, pp. 381–409, 2007.

[44] Organization for Economic Co-operation and Development (OECD, 2022), “West Africa Gateway.” Accessed: Oct. 20, 2022. [Online]. Available: https://www.oecd.org/swac/publications/Nigeria_e-version_en_light.pdf

[45] M. K. Herndon and J. B. Hirt, “Black students and their families: What leads to success in college,” *J. Black Stud.*, vol. 34, no. 4, pp. 489–513, 2004.

[46] F. J. Onuma, B. Berhane, and S. L. Fries-Britt, “‘I’ve always been in private school’: The role of familial norms and supports in Black immigrant students’ preparation for STEM majors,” *J. Divers. High. Educ.*, vol. 15, no. 2, p. 241, 2022.

[47] B. A. Burt, “Broadening participation in the engineering professoriate: Influences on Allen’s journey in developing professorial intentions,” *J. Eng. Educ.*, vol. 109, no. 4, pp. 821–842, 2020.

[48] C. C. Samuelson and E. Litzler, “Community cultural wealth: An assets-based approach to persistence of engineering students of color,” *J. Eng. Educ.*, vol. 105, no. 1, pp. 93–117, 2016.

[49] T. J. Yosso *, “Whose culture has capital? A critical race theory discussion of community cultural wealth,” *Race Ethn. Educ.*, vol. 8, no. 1, pp. 69–91, Mar. 2005, doi: 10.1080/1361332052000341006.

[50] S. Secules *et al.*, “Positionality practices and dimensions of impact on equity research: A collaborative inquiry and call to the community,” *J. Eng. Educ.*, vol. 110, no. 1, pp. 19–43, 2021.

[51] J. W. Creswell and C. N. Poth, *Qualitative inquiry and research design: Choosing among five approaches*. Sage publications, 2016.

[52] W. Pillow, “Confession, catharsis, or cure? Rethinking the uses of reflexivity as methodological power in qualitative research,” *Int. J. Qual. Stud. Educ.*, vol. 16, no. 2, pp. 175–196, 2003.

[53] D. O. Green, J. W. Creswell, R. J. Shope, and V. L. P. Clark, “Grounded theory and racial/ethnic diversity,” *Sage Handb. Grounded Theory*, pp. 472–492, 2007.

[54] C. R. Cooper, J. F. Jackson, M. Azmitia, and E. M. Lopez, “Multiple selves, multiple worlds: Three useful strategies for research with ethnic minority youth on identity, relationships, and opportunity structures,” in *Studying minority adolescents*, Psychology Press, 1998, pp. 121–136.

[55] M. J. Crotty, “The foundations of social research: Meaning and perspective in the research process,” *Found. Soc. Res.*, pp. 1–256, 1998.

[56] A. Johri and B. M. Olds, *Cambridge handbook of engineering education research*. Cambridge University Press, 2014.

[57] N. V. N. Chism, E. Douglas, and W. J. Hilson Jr, “Qualitative research basics: A guide for engineering educators,” *Rigorous Res. Eng. Educ. NSF DUE*, vol. 341127, pp. 1–65, 2008.

[58] C. K. Riessman, *Narrative methods for the human sciences*. Sage, 2008.

[59] D. J. Clandinin and V. Caine, “Narrative inquiry,” in *Reviewing qualitative research in the social sciences*, Routledge, 2013, pp. 166–179.

[60] D. J. Clandinin, D. Pushor, and A. M. Orr, “Navigating sites for narrative inquiry,” *J. Teach. Educ.*, vol. 58, no. 1, pp. 21–35, 2007.

[61] F. M. Connelly, *Narrative inquiry: Experience and story in qualitative research*. Jossey-Bass, 2000.

[62] J. W. Creswell and V. L. P. Clark, *Designing and conducting mixed methods research*. Sage publications, 2017.

[63] P. Liamputtong, “Focus group methodology: Introduction and history,” *Focus Group Methodol. Princ. Pract.*, vol. 224, pp. 1–14, 2011.

[64] J. W. Creswell, “Steps in conducting a scholarly mixed methods study,” 2013.

[65] S. B. Merriam and E. J. Tisdell, “Designing your study and selecting a sample,” *Qual. Res. Guide Des. Implement.*, vol. 67, no. 1, pp. 73–104, 2016.

[66] J. W. Creswell and D. L. Miller, “Determining validity in qualitative inquiry,” *Theory Pract.*, vol. 39, no. 3, pp. 124–130, 2000.

[67] S. Secules, A. Gupta, A. Elby, and E. Tanu, “Supporting the Narrative Agency of a Marginalized Engineering Student: Narrative Agency of a Marginalized Engineering Student,” *J. Eng. Educ.*, vol. 107, no. 2, pp. 186–218, Apr. 2018, doi: 10.1002/jee.20201.

[68] A. Slaton and A. Pawley, “The Power and Politics of STEM Research Design: Saving the ‘Small N,’” in *2015 ASEE Annual Conference and Exposition Proceedings*, Seattle, Washington: ASEE Conferences, Jun. 2015, p. 26.1564.1-26.1564.13. doi: 10.18260/p.24901.

[69] E. A. Drost, “Validity and reliability in social science research,” *Educ. Res. Perspect.*, vol. 38, no. 1, pp. 105–123, 2011.

[70] S. Secules, “Putting diversity in perspective: A critical cultural historical context for representation in engineering,” presented at the American Society for Engineering Education Annual Conference, 2017.

[71] P. J. Corfield, “All people are living histories–which is why History matters,” *Mak. Hist.*, 2008.

[72] K. Hovland, *Shared Futures: Global Learning and Liberal Education*. Association of American Colleges and Universities, 2006. [Online]. Available: https://books.google.com.ng/books?id=-hzYAAAAMAAJ

[73] R. Capps, K. McCabe, and M. Fix, “Diverse streams: African migration to the United States,” *Migr. Policy Inst. Wash. DC*, 2012.