

Advancing HBCU Students' Interests in Residential Construction Careers through an NAHB program: An Industry-University Collaboration

Dr. Andrea Nana Ofori-Boadu, North Carolina A&T State University

Dr. Andrea N. Ofori-Boadu is an Assistant Professor of Construction and Construction Management with the Department of Built Environment within the College of Science and Technology at North Carolina Agricultural and Technical State University (NCA & T). Her research interests are in bio-derived cement replacement materials, delivery of sustainable built environments, and professional identity development in architecture, engineering and construction (AEC) students.

In February 2019, Andrea received the prestigious National Science Foundation NSF - CAREER award to research professional identity development processes in undergraduate AEC women. She has also received grants from East Coast Construction Services, Engineering Information Foundation, and the National Association of Home Builders. Dr. Ofori-Boadu was selected to participate in the 2019 QEM-NSF INCLUDES summit. In 2018, she was selected as a 2018 National Science Foundation - NC A & T ADVANCE IT Faculty Scholar. She also received the 2018 CoST Teaching Excellence Merit Award. Dr. Ofori-Boadu received both the 2017 NC A & T - CoST Rookie Research Excellence Award and the 2017 North Carolina A & T State University (NCAT) Rookie Research Excellence Award. Under her mentorship, Dr. Ofori-Boadu's students have presented research posters at various NCAT Undergraduate Research Symposia resulting in her receiving a 2017 Certificate of Recognition for Undergraduate Research Mentoring. In 2016, her publication was recognized by the Built Environment Project and Asset Management Journal as the 2016 Highly Commended Paper. Andrea has served as a reviewer for the National Science Foundation (NSF), Environmental Protection Agency (EPA), and several journals and conferences.

In 2015, Dr. Ofori-Boadu established her STEAM ACTIVATED! program for middle-school girls. She also serves as the Executive Vice-President of Penuel Consult, Incorporated. She is married to Victor Ofori-Boadu and they are blessed with three wonderful children.

Prof. Robert B. Pyle, North Carolina A&T State University

Dr. Pyle is a full professor in the Department of Built Environment in the College of Science and Technology at North Carolina A&T State University and he has been project director of numerous federal and state projects. He is a Certified Constructor with 25 years of experience in residential construction and 10 years of experience with manufactured and modular housing both in the classroom and the field. He has directed projects dealing with weatherization, energy, construction practices and improvement of housing for low income residents in several parts of North Carolina. His education degrees are BA and MA from The College of New Jersey and a Ph.D. from the University of Pittsburgh, Pittsburgh, PA. Dr. Pyle has received awards for outstanding leadership, teaching and named the researcher of the year in 2005 for the School of Technology. Recently, he has been rated by his peers as an outstanding professor in the School of Technology.

Dr. Pyle has performed exceptionally well both as a programmatic coordinator and manager and has received wide acclaims at the local and national level. North Carolina Agricultural and Technical State University's HUD project which he was the PI was requested by SEEDCO to present at its annual "HBCU Community Development Partnership for the Future" and its success was displayed at SEEDCO's conference. Furthermore, the HUD Telecommunications Grant directed by Dr. Pyle won the HUD's Best Practice Award at the state level. With 30 years of working with the city residents and local agencies, he is knowledgeable of HUD requirements at the University, city, county and state levels.

Dr. Pyle headed the Leadership and Community Development Research Cluster for several years at North Carolina Agricultural and Technical State University. His experience and expertise has been invaluable to the University in acquiring numerous grants over the past 20 years. He is a Certified Professional Constructor, member of the American Institute of Contractors and is nationally certified by the Building Performance Institute (BPI).

His areas of research include energy efficiency and management, safety at heights, indoor air quality, residential construction processes and manufactured housing techniques.

Iyshea Borders-Taylor

Iyshea Borders-Taylor, more commonly known as Iyshea Borders, is a biomedical engineering student at the University of North Carolina A&T State University. Ms. Borders is scheduled to graduate in May of 2021.

Dr. Christian A. Bock Hyeng, North Carolina A&T State University

Christian A. Bock Hyeng is currently an Associate Teaching professor of Construction Management, College of Sciences and Technology at North Carolina Agricultural and Technical State University, Greensboro NC. He earned his B.S. in building construction in 2000, M.S in Bridge construction in 2002 and a Ph.D. in Technical Science, strength of Material in 2006 from the Russian People's Friendship University, Moscow, Russia. Dr. Christian Bock Hyeng is currently teaching Civil Engineering and safety course courses at the North Carolina Agricultural and Technical State University in Build environment department under the College of Science and Technology. He is a visiting professor at the Bamenda University Cameroon, His interests are in Structural Mechanics, strength of material for sustainable construction, Bridge Construction. He has written and published several studies in collaboration with faculty in the research area of strength of material. He is an active member of the Cameroonian Association of Civil Engineer (CACE) also an active member of American Society of Civil Engineering (ASCE). He was a Co-PI on a USDA proposal, Beginning Farmer and Rancher Development Program 2014 also, serve as Co-PI on a DWC Myrtle beach water management, he is a Reviewer for the technical journal (IJME). Dr. Christian A. Bock Hyeng may be reached at cbhyeng@ncat.edu

Dr. Tony E. Graham, North Carolina A&T State University

Tony E. Graham, D. Eng., Assoc. AIA, is an Associate Professor (Tenured) - Navy Research Fellow in the Department of Built Environment - Construction Management program - College of Science and Technology at North Carolina A&T State University, Greensboro where he specializes in sustainable construction, building information model (BIM) and geographic information systems (GIS). He received his Doctorate of Engineering and Masters of Architecture from Morgan State University and BS in Architectural Engineering from North Carolina A&T State University. With over 30 years of combined professional and academic experience, Dr. Graham has served as principal investigator on research projects addressing GIS and BIM technology and education, including projects on a) the development of a GIS carbon footprint model and b) anti-terrorism and airborne contaminants. From 2000 to 2018, Dr. Graham has presented his research at state, regional and international conferences. Dr. Graham has received several awards including National Black Herstory Task Force Recognition, several North Carolina Sustainable Building Design Competition Awards, Environmental Design + Construction Sustainable Design Award, American Society for Quality Competition Award, and an Outstanding Teacher of the Year Award. He has developed undergraduate architectural curriculum and Masters of Architecture programs. He has also developed undergraduate curriculum in construction management using BIM technology. Currently, he is working on developing BIM certification programs at the graduate level.

Advancing HBCU Students' Interests in Residential Construction Careers through an NAHB program: An Industry-University Collaboration

Employers are implementing various strategies to improve construction students' interests in residential construction careers to address workforce shortages. In order to advance construction students' learning experiences and residential career interests, the National Housing Endowment, National Association of Home Builders (NAHB), and True Homes USA, awarded a \$100,000 grant to a historically black college/university (HBCU). The goal is to strengthen industry-university collaborations between residential construction organizations and the HBCU through an NAHB - Residential Construction Certificate Program, which includes NAHB memberships, scholarships, educational programming, and networking opportunities. Key NAHB program components include: (1) Residential construction modules in construction courses; (2) Travel and participation in NAHB International Builders Show (NAHB-IBS); (3) NAHB student organization; (4) Recruitment; (5) Scholarships; (6) Residential construction employment; (7) Field trips; (8) Professional development sessions; (9) NAHB student competition team for national NAHB four-year universities competition; (10) Residential construction certificates; and (11) Program evaluation and reporting. Drawing from foundational principles in professional career identity development, the purpose of this research was to gain insights into the residential construction learning experiences of HBCU-NAHB program participants. This limited case study approach involves the authors' experiences, NAHB program data analysis, and the administration of two self-reporting surveys with open-ended questions to gain insights into HBCU students' learning experiences as they participated in various components of this NAHB program. Thematic data analysis involves coding, categorization, and descriptive statistics. Also, the best practices, challenges, and lessons learned from the NAHB program are described.

Results indicated that students' had gained residential construction knowledge and career interests. Positive experiences included increased understanding of the technical and managerial aspects of residential construction, real-life industrial experiences, professional development, development of soft skills, improved sense of belonging, and lowered financial burden through scholarships and internships. The few negative experiences included long travel times, new group discomfort, and feelings of inadequacy during NAHB competition team preparation. Seventy-five percent (75%) of students were interested in residential careers because of their desire to flip homes, prior residential construction experiences, NAHB activities, and passion to provide people with quality housing. Twenty-five percent (25%) of students were disinterested in residential careers because of prior commercial construction experience, higher salaries in commercial construction, and uncomfortable weather conditions at residential sites. Key challenges included difficulty in student selections and schedule conflicts. The proposed best practices model for industry-university collaboration had four components: (1) Initiation; (2) Establishment; (3) Engagement; and (4) Evaluation.

The NAHB program has had positive impacts on construction students' learning experiences and residential construction career interests, as students feel better prepared for residential construction careers. This program described may be replicated at other universities, particularly at HBCUs, for improved residential construction learning and career interests. In the long term, this would increase the quantity and quality of residential construction professionals for 21st century built environments.

Introduction

Residential construction involves the designing, construction, selling, and renovation of single-family and multi-family homes. The public sector spent about 6.4 billion dollars on residential construction in 2017 [1]. Typically, the residential construction industry has been known to use traditional materials, methods, and technologies. However, in the last couple of decades, this industry has had to consider adopting emerging technologies that are used in the commercial construction industry sector [2]. The construction industry continues to evolve with recent adoption of emerging technologies such as sustainable materials, technologies, and management; building information modeling; wearable technology, among many others [3][4][5][6]. Decisions regarding the adoption and successful implementation of both traditional and emerging technologies are greatly influenced by influential professional roles to include presidents, general managers, construction managers, project managers, project engineers, etc. [2]. Consequently, it is imperative that undergraduate programs maintain students' residential construction interests for their successful transition into these professional roles in the residential construction sector. Several undergraduate construction programs have modified program curricula to prepare students for the 21st century career demands by equipping them with relevant knowledge and skills in recent technologies such as building information modeling (BIM) technologies [7]. Also, various strategies are being implemented to strengthen students' career identities and smoothen their transitions into professional roles upon graduation. The development of residential professional career identities in undergraduate students is critical for their sustained interests, persistence into residential construction professional roles, and their eventual contribution to the planning and development of 21st century residential construction projects.

Professional career identity development

This paper draws from foundational theories associated with professional identity development. Professional identity development occurs when a person adopts the values, practices, and competencies associated with a particular professional role upon interactions with the related professional community. External influences through causal links result in changes in behavior and capacity of participants [8][9]. Conceptually, career identity formation is congruent to the personal identity development processes in human beings with some identities remaining stable throughout life, while others are more dynamic and change [10]. There is a long-held belief that human beings develop their identities in stages [11][12][13][14]). Even at the early stages of middle-school education, the self-efficacy and professional identities of girls were enhanced through their engagement in art-modified STEM projects [15]. A framework was developed by Kegan (1982) and proposed that six stages of identity formation (incorporation, impulsion, imperial, interpersonal, institutional, and interindividual) represented the longitudinal development of the self from childhood to adult life [16]. The most powerful factors that influences the process of socialization and career identity development are role models, mentors, and the accumulation of individual experiences that shape professional identity through both conscious and unconscious processes that advance both explicit and tacit knowledge [17][18][19][20][21][15]. Symbols and rituals also shape professionals, as individuals who participate in these activities, publicly indicate that they are joining a professional community and this helps develop their professional career identities [19][18]. Professional development programs contribute to professional development of students [22][23].

Informal learning opportunities draw from these theories and there is evidence that these opportunities influence professional identity development in students. Informal learning can initiate a deeper relational process of personal change that is characterized by the emergence of a professional career identity [24][25][26]. An industry-university collaboration towards the implementation of a professional development program for construction students improved their interviewing and soft skills, contributing to their professional identity development [22]. Well-designed informal learning programs will provide construction students with exposure to role models, mentors, experiences, symbols and rituals within the architectural-engineering-construction (AEC) professional community to enhance their professional identity development. This occurs because these experiences encourage students' reflections, interests, persistence, and and bring them to full participation in the construction professional community.

Background

Through a formal proposal submission by an HBCU for the development of a Residential Construction Certificate Program, the HBCU was awarded \$100,000 through a collaborative effort involving the National Housing Endowment, the National Association of Home Builders', and True Homes, U.S.A. This four-year program was designed to engage students in residential construction learning activities to increase the quantity and quality of construction students prepared for residential construction careers. The goal is to strengthen collaborations among residential construction organizations and the HBCU by providing construction students with first-hand exposure to the real world of the residential construction industry. The program involved NAHB memberships, scholarships, educational programming, and networking opportunities. Key strategies included implementation of courses with residential construction modules, provision of scholarships, student participation in field trips, establishment of a National Association of Home Builders (NAHB) student organization, residential construction professional development sessions, residential construction internships/full time employment, Group Me Mobile Messaging forum, participation in annual NAHB-International Builders Shows, participation in the national NAHB four-year student competition, and the residential construction certificate program. In this paper, the best practices, challenges, and lessons learned from the NAHB program are described. Emphasis is placed on students' learning experiences and interests in residential construction careers.

Methods

This case study research adopted an action research philosophy, by combining empirical and rational processes to gain insights into situation-specific data and contribute to existing knowledge. An axiological disposition was preferred to include authors' values and experiences in discussions and analysis. Empirical evidence is built from a case study on best practices and lessons from the implementation of this NAHB program, as well as program data and results from two self-reporting surveys administered to 45 undergraduate students enrolled in construction courses offered by an HBCU located in the southeast region of the U.S. The three sections of the survey are: (1) background information; (2) participation in learning experiences and student organizations; (3) positive and negative experiences associated with student organizations and learning environments. Data analysis involved weighted means and descriptive

analysis of frequently occurring words and emerging thematic categories. Figures and tables are used to summarize findings.

Results and Discussions

Description of participant populations

Although 45 students were included in this study, only data from 44 completed surveys were included in the analysis. Male students made up 80% of the respondent population. The classification of participants were as follows: freshmen (18%); sophomores (47%); juniors (22%); and seniors (13%). Seventy-three percent of the participants had GPAs exceeding 2.5 on a 4.0 scale. Seventy-five (75%) of participants had some levels of industrial experience ranging from internships to full-time employment.

Case Study

The best practices, challenges, and lessons learned through the implementation of various learning strategies to improve residential construction interests and identities are described in this section:

Implementation of courses with residential construction components

This program included six construction courses with residential construction modules, and had approximately fifty students enrolled each year. The special modules focused on blueprint reading, specifications, materials, methods, building codes, and estimates for residential construction projects. The mean of a blue print reading practice assignment for a residential construction project was 85%, while mean test score was 76%. This was primarily because during practice assignments students were permitted to work in teams, but had to work independently during tests. Tutoring sessions are offered to students who face challenges in blueprint reading. Other courses such as accounting, surveying, safety, legal environment in business, environmental control systems, planning and scheduling, structures, and management concepts provide students with valuable knowledge and skills that are beneficial to any construction organization. Knowledge, understanding, and skills gained improved construction students' competence and performance to enhance their residential construction interests and professional identities.

Travel and participation in 2018 NAHB International Builders Show

Nine (9) students, three (3) faculty members, and one (1) University Advancement Director of Development attended the 2018 NAHB International Builders' Show held in Orlando, Florida. They participated in the 2018 NAHB International Builders' Show held in Orlando, Florida. They participated in activities such as the NAHB Student Chapter Competition sessions, Student Chapter Award Ceremony, and NAHB Student Chapter Advisory Board Meeting. The faculty members participated in the Advisory Board meeting. Students benefited from increased knowledge of residential construction materials and emerging technologies and interest in

residential construction careers. In addition the strengthening of peer student relationships, connections with residential builders were established and this even led to job opportunities. A success story was that one male construction junior student initiated communications with a residential construction representative and this led to a summer internship. Interestingly, at the end of the summer internship, this student was transferred to serve in a full-time position in the city where the HBCU is located. During the last career fair at the HBCU, he was the booth host and represented the organization well. His peers were excited to see him on the other side of the residential construction organization's booth collecting their resumes and engaging them in career related discussions. This overall experience has strengthened his residential construction professional identity, as he looks forward to gaining full-time employment upon graduation. Furthermore, students who participated in the IBS had the opportunity to observe other four-year college competition teams present their proposals. These vicarious experiences improved students' self-efficacy as the observed students from other universities excel in their presentations. Key challenges involved student selection, excessive travel paperwork, students backing out at the last minute, and the tiresome nine-hour road travel to Florida. A few students complained about not getting enough sleep and having limited food options. Familiarity with travel paperwork, more administrative support, task assignments to student leaders, and increasing students' awareness of challenges associated with such travel will ease future travel experiences.

Establishment of NAHB student organization

Eleven (11) students attended the first NAHB student interest meeting and a temporary e-board of seven (7) students was formed to establish the NAHB student organization at the HBCU. The NAHB student chapter toolkit for secondary program was adopted and submitted during the student organization establishment process at NC A & T. With the support of the local NAHB chapter, the student organization was officially recognized by the national NAHB with nineteen (19) students being the initial members of this organization. Logo and language from NAHB documents were adopted for recruitment and other events. New executive members were elected and the organization hosts monthly meetings to engage students in a variety of professional development activities. A key challenge has been getting a meeting time with minimal schedule conflicts, as some students are unable to attend meetings due academic or work related responsibilities. A Group Me Mobile Messaging forum has been effective in keeping 31 students updated on upcoming events.

Recruitment

Campus recruitment is primarily through NAHB student organization executives visiting construction classrooms to invite students to participate in the organization. This has been effective as more students have shown interest in the organization. Other recruitment strategies have involved flyers, emails, and word of mouth. Other majors from business programs have participated in student meetings. NAHB student organization executives also participate in the HBCU's open house where NAHB flyers are handed to interested persons. Fifty (50) high-school students participated in the 2018 SciTech Week with the College of Science and Technology and

visited the lead authors' concrete laboratory, where they were informed about NAHB scholarships and other educational opportunities. Email messages have been sent to some high school instructors and principals regarding potential collaborations, but response rates have been low. Consequently, telephone calls will be used as a follow up to initial emails. Lastly, a summer camp to introduce middle-school girls to STEM and residential construction careers has received enormous interest from the community. A key challenge is that there are limited opportunities that are unable to meet the overwhelming demand by program applicants.

Scholarships

Ten (10) construction students received \$500 scholarships for an academic semester. The scholarships process was rigorous requiring students to have a 2.5 GPA, express a strong interest in residential construction through an essay, and provide a resume, transcript, and academic recommendation letter. Scholarships are applied directly to student's tuition bills through the financial aid office, and reduced students' financial burden. Scholarships increased students' interest and commitment to the NAHB student organization, as 60% of students on the competition team received NAHB scholarships. A key challenge was having to deny students who did not meet the minimum scholarship requirements, but still showed strong residential construction interests.

Residential construction internships and full-time employment

Through partnerships with True Homes and its subcontractors, five students gained residential construction internships. A formal process was set up for students to send their resumes to the lead author, who then forwarded them to a True Homes Director. Qualifying students were interviewed and selected for the internships. The five students who gained internships increased in knowledge and understanding of the technical and managerial aspects of residential construction projects. Sixty-percent (60%) of these students worked with True Homes, and 40% worked with True Homes subcontractors for concrete and plumbing. This exposure was an important learning experience that improved their interests and competencies in residential construction. While, it was hoped that these students with internships would play significant roles in the competition team, a key challenge was that they were unable to participate due to schedule conflicts.

A recently graduated female construction student, who had gained full-time employment with an American real estate development company that constructs single-family detached homes across the United States, expressed a strong desire to come and give back to the program. Her actual words were '... You all love to see your students succeed and of course I am one of your success stories. Yes, Magna Cum Laude and all, but more importantly was for me to come and give back, especially as a non-traditional student...' This was part of an email sent to the lead author requesting for opportunities for her Director to speak to students about residential construction careers. Through her full-time employment, her residential construction professional identity has been so much strengthened that she desires to come back to recruit from the HBCU. With increased participation of True Homes and other residential construction organizations in the HBCU's Career Awareness Programs, it is hoped that more students will be considered for future residential construction internships.

Field trips

Four separate field trips to True Homes subdivision developments engaged 62 students in meaningful and valuable residential construction activities. Initially, students met at the model home where they were provided with an overview of True Homes operations and subsequently, with hard hats and blue prints. Students then drove to a neighboring home under construction, where they were exposed to construction materials and practices. Students saw and touched different materials and systems. Feedback indicated that students were more interested in the technical aspects (81%) than in the managerial aspects (76%) of the building process. Technical aspects included excavations, grading, concrete foundations, framing methods, insulation, termite control, installation of bath tubs, and HVAC systems in residential buildings. Management aspects related to estimating, scheduling, managing subcontractors, and monitoring quality and safety. Seventy-five percent (75%) of the students were interested in residential construction careers as a result of their desires to flip homes, prior residential construction experiences, NAHB activities, and passion to provide people with quality housing. The students who showed a lack of interest in residential construction careers were mostly students with prior experience in commercial construction. They stated that they preferred commercial construction because of the more money and more extensive scope of work. One student had a major challenge in dealing with weather discomforts, and was willing to explore residential construction careers under more comfortable weather conditions.

A major challenge to the field trips was that many students found it to be so engaging that they wanted to stay longer beyond the one-hour class period. One student noted that ‘...overall the true homes (field trip) experience was very useful. It gave an opportunity to actually put (match) lessons and things we have learned with real life examples. I got a chance to speak with the builders and ask them questions, which received real life answers. It was an enjoyable experience. What I enjoyed was being on an actual site and putting the lessons learned with real life examples, instead of just looking in a book and trying to think of it physical in your head. If I could change one thing about the experience (field trip) it would be how long our class time was on the day we went, longer class time would make it easy to walk through a little more...’ In the future, two-hour lecture periods will be used for field trips to give students amply time for exploration and effective learning.

Professional development sessions

Two professional development sessions were organized to engage 52 students in residential construction career discussions. The first professional development session was in collaboration with another student organization and the faculty speaker focused on financing construction projects. The second session was on professional development for residential construction careers and the four-member panels comprised of residential construction experts from True Homes. Feedback from students were excellent as they learnt more about the technical and managerial aspects of residential construction. At the end of the session, students had one-on-one discussions with the speakers. These sessions were effective in generating students’ interests in residential construction. The speakers served as role-models who motivated students by providing critical answers to their questions about residential construction careers. Verbal

persuasion is an effective tool for improving self-efficacy, which has a positive impact on professional identity development in students.

NAHB Student Competition team

A team of ten (10) students participated in the 2019 IBS in Las Vegas. Six (6) of them were on the main presentation team, and the other four were on the reserve team. The team started as a much larger team of more than 20 students and as the project demands and pressures heightened, the team shrunk primarily because of schedule conflicts. Sixty percent of the team had received NAHB scholarships; perhaps, scholarships increase students' participation. The team successfully submitted a 94-page sub-development proposal for a 152-acre property located in Coweta, Oklahoma. As part of the proposal, the team conducted market analysis, product development, land development, estimate, schedule, and financial analysis. They met as a team on a weekly basis, and worked individually or in sub-teams in between meetings. In addition to the faculty coach, there were two external coaches who committed valuable time to join weekly meetings and guide students on this project. Students valued personal and professional experiences shared by coaches during competition preparation sessions. While the project was rigorous and time-consuming, students gained valuable experience and understanding in residential construction subdivision development. They also developed valuable problem solving, critical thinking, team work, and communication skills. Mock presentation sessions were held to prepare students. They usually involved the two industry coaches, three faculty members, and other construction students who assessed students' presentation skills and providing meaningful feedback. Students also delivered presentations to the National Endowment executives during their site visit to the HBCU. The competition team did well in their presentation at the national competition, and feedback from the judges will be used for competition team improvements.

Overall this experience has improved the residential construction career interests of all the students on the competition team. One student commented that '...NAHB has made me become more involved. When you start doing things you like you have no other choice, but to get more involved and you can pick up and learn things at a faster rate...I would like a career in residential construction because I like dealing with people and residential is helping one build a home so it brings things more down to a personal level...'

Key challenges included schedule conflicts, travel funds, travel documentation, and poor participation by students who had participated in residential construction internships. Although, students who gained internships through this NAHB grant were unable to actively participate in the competition team, 80% of them attended some competition preparation meetings and contributed to the proposal during the initial phases. However, they had schedule conflicts and were unable to combine their current course workload with the rigorous demands of competition team. Consequently, they pulled out of the team and did not participate at the final stages of the competition proposal submission and presentation. It is hoped that in the future, NAHB competition proposal requirements be included as a major project in one or two construction courses so that students can earn academic credit for their extensive time investments. Faculty

and administrative approvals have to be obtained before this recommendation can be implemented.

Residential Construction Certificate Program

Residential Construction Certificate applications were sent to the three senior students who will be the first students to qualify for this certificate since this program is just over a year old. Two of the students have submitted their applications, and will receive the certificates at the end of the year. Qualification requires passing all sixteen selected courses, completing volunteer hours with Habitat for Humanity or equivalent organization, and participation in NAHB student organization.

Program evaluation and reporting

Monthly program evaluation is conducted by the program team and reports are emailed to the National Housing Endowment. During an annual site visit the faculty team submitted a final report and presentation to executives from the National Housing Endowment, NAHB, and True Homes. Findings are disseminated primarily through national publications and presentations.

Positive learning experiences with NAHB student organization

Many students had participated in various levels in NAHB related learning events. On the average, 44 students provided a mean participation rate of 2.4 on a five-point Likert scale. This was relatively high as among the five student organizations assessed in this research study, this NAHB participation rating was second to only one other student organization which holds weekly meetings. Data from the self-reporting survey was analyzed and categorized to reflect emerging themes. Themes associated with frequently occurring words with similar meanings were included in figure 1. These themes are generated from related words noted by at least 10% of the respondents.

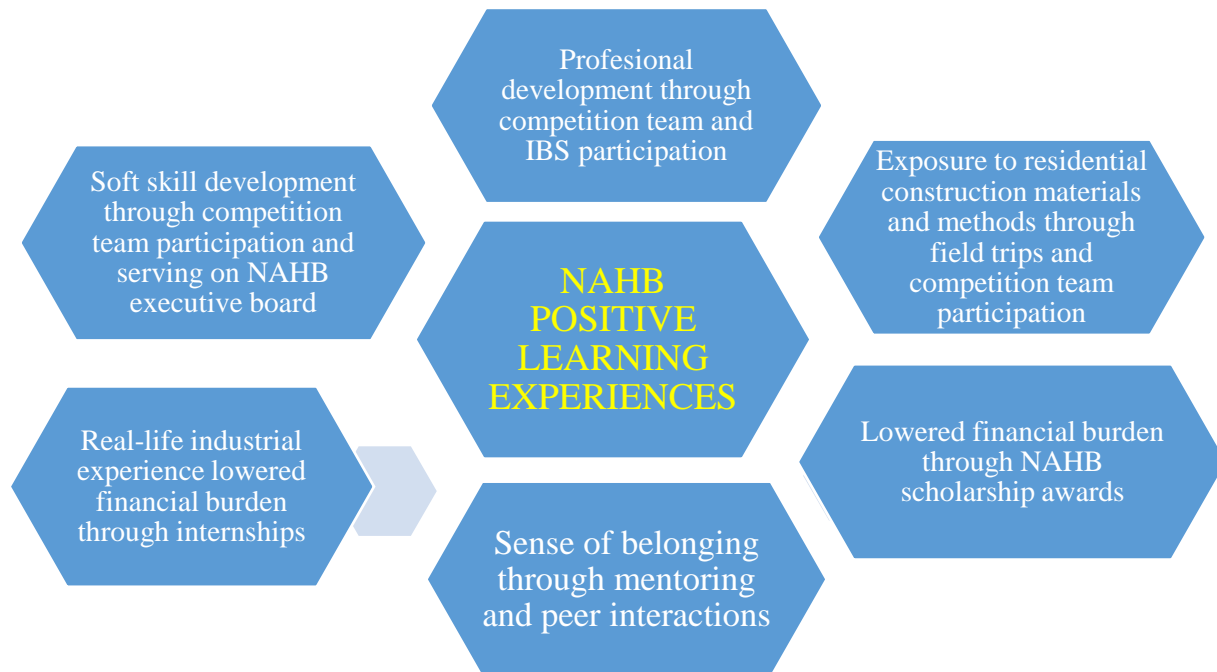


Figure 1. Positive learning experiences

Regarding positive learning experiences, students valued real-life construction industry experiences provided by the various interactions with NAHB, True Homes professionals, and other residential construction organizations. Students noted that they had developed soft skills such as critical thinking, creativity, leadership, teamwork, and networking through their association with NAHB, and particularly with the competition team participation. Students also valued relationships that existed among themselves during informal learning sessions. Peer teaching and mentoring had improved their sense of belonging to the construction program.

Negative learning experiences

The few negative experiences listed in the surveys were most personal. Students expressing their difficulty in fitting into the organization and feeling that they can not contribute much to the group due to the advanced level of work in progress by the completion team. In the busyness of organizational events, sometimes, the newer students are not given enough attention. NAHB student leaders and members should be trained to pay more attention to potential members who participate in their meetings.

Best Practices Model for Industry-University Collaboration

Drawing from this case study and the authors' experiences with other grants that promote industry and university partnerships for the career interests and identity development of undergraduate students, the industry-university partnership model is proposed in figure 3. It highlights the critical components of a successful industry-university collaboration model to include:

Initiation

This is the first stage of the process when either the university or its partner begins sharing ideas regarding potential activities towards a specific and well-defined goal that is beneficial to all potential collaborators. Ideas and vision are shared through a formal document and negotiations occur until there is full agreement.

Establishment

This second stage involves the various internal processes that occur in various organizations prior to the implementation of any new activities or strategies. It is important to involve and train all lead participants.

Engagement

This third stage involves the implementation of actual program or project activities in order to reach targeted participants and achieve all set goals. Time schedules, budgets, and other quality control measures should be implemented.

Evaluation

This fourth stage involves frequent formative and summative assessments that compare the outcomes of actual activities with proposed outcomes. Corrective strategies have to be implemented to meet pre-designed outcomes, unless alternative agreements are made among collaborators.



Figure 3. Best Practices Model for Industry-University Collaboration

Conclusion

The NAHB-university partnership has been effective in exposing and engaging undergraduate construction students in meaningful real-life residential construction professional experiences that have improved their residential construction knowledge, interests, sense of belonging, and residential construction professional identities.

Best practices and the efficient management of challenges contributed to program success. Lessons learned are used as the basis for continuous improvement. A best practices model for industry-university collaboration is presented. Dissemination of findings will encourage the replication of similar programs in other construction engineering and management programs in the United States, particularly at HBCUs. In the long term, this will strengthen the residential construction career identities of students and increase the quantity and quality of qualified residential construction professionals to improve the overall performance of the 21st century residential construction industry.

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