Leadership and Community Service

Please name a person or movement that has inspired you and describe how this has affected your life. 500words

Being a MasterCard Foundation (MCF) Scholar at Ashesi University was the greatest privilege ever given me as a student. The program has not only pushed my dreams forward but also offered me the heart of service to my community in ways I never imagined. As I was among the selected few brilliant and talented minds from across Africa, I was given opportunities to explore my chosen field of engineering, lead other young people, and impact others in ways that I would not have able to, given my financial situation. In the MCF family, I met great people like Rita Roy, CEO of the MasterCard Foundation, and Patrick Awuah, President of Ashesi University, and I was inspired by their stories of philanthropy, innovation and ethical leadership. These inspirational leaders challenged me and increased my courage to break barriers and create new opportunities in the Ashesi community and beyond. While being a scholar, I enjoyed being a student tutor and a mentor to other African students, a Baobab Ambassador, a class representative on the Ashesi Judicial and Electoral Council, Resident Assistant and a project lead. Outside school, I worked as a community leader in several community projects. All these roles have transformed and prepared me for commitment to action, ethical and transformational leadership.

 Describe any previously held leadership position, activities, or experiences: (i.e. position where you guided or led a group of people, a project, or a cause)

In my leadership as a Math Resource Center Assistant at Ashesi University, I was driven by a passion for impacting the lives of many students who found mathematics to be complicated and challenging. Before that, I had been a vice-president of the Math Club in my secondary school, and I knew how to improve one’s ability in solving mathematical problems. Helping over 300 students with core mathematics and elective mathematics, and being honoured to be a member of the National Science and Math Quiz team in my secondary school were the most motivating factors that cemented my love for teaching mathematics at the tertiary level.

As I made it to college, taking the role of a Math Resource Center Assistant was my biggest delight. Each week, I held two sessions with a selected group of students assigned to me by faculty and took them through several topics they were finding difficult. Through these sessions, I gained a wealth of knowledge on the psychological effects that low performance in mathematics brings to student. I introduced a technique of each student sharing their feelings about mathematics and this enabled me to track and recognise the personal and academic progress that each of them made in the semester. They impressed me with their course work and 80% passed with distinction as I helped them enjoy the concepts they had learned in class. While I was assisting others to understand concepts like differentiation, integration, parameterization, differential equations, and statistical experiments, I also developed my confidence, perfected my mathematical skills, increased my communication skills and expanded my network.

 How do you define leadership?

Before going to college, I was used to the notion that leadership is all about being in a high position with the power to accomplish a responsibility for oneself. But as I went through four years of college in an institution founded on ethical leadership, my reference point of leadership changed remarkably. The experiences I had from extracurricular activities, internships, and community engagements made me understand that leadership is not about performing responsibilities, but rather it is an act of motivating or influencing oneself or a group of people positively to act towards achieving the desired goal.

What does leadership mean to you?

Personally, leadership means service, motivation and transformation. I believe that to lead oneself or a group of people to achieve a desired goal; one must lead a servantly and exemplary lifestyle that motivate people (followers) to achieve great things.

What makes someone a good leader?

I am very inspired by the famous quote of the former U.S Secretary of State, Henry Kissinger. He said, “the task of a leader is to get people from where they are to where they have not been.” This quote reflects genuinely on the constituents of every good leader who desire to lead his or her people servantly to progress and development. The quest to finding the qualities of a good leader was answered by John Welch, former CEO of General Electric.

According to him, every good leader must have the four E’s of leadership and I agree with him. From his experience of serving at General Electric, he found out that a good leader must have high personal **energy** to manage, an intense energy or the courage to **energize** his people, an **edge** to dream, take tough decisions and must be able to **execute** decisions made. He or she must also have a **passion for serving and upholding his or her integrity**. These qualities enable a leader to influence others to support his or her vision and also work together to remove obstacles that prevents progress.

What leadership skills do you think you have?

I am a servant leader and a life-long learner who welcomes every opportunity to serve and encourage the success of all people. I believe in the power of leading others to become successful. Reflecting on my leadership skills, I have a great **sense of courage and commitment** towards helping others multiply their potentials to achieve results. I always lead by **influencing** others through **effective communication: listening actively to others**, **collaborating with them**, and also telling stories and personal experiences to **inspire** them. I love to lead by **following** set objectives, **supporting** others and taking **responsibility** for the desired outcome. I remember while serving as student mentor, resident assistant, baobab ambassador and a class representative, these were the qualities that I exhibited to make 80% of international freshmen students settle smoothly into the Ghanaian community, impact the welfare of members in my hall positively, increase MasterCard Foundation scholars’ engagement on the Baobab Platform, and also assisted the implementation of the first social honour in Ashesi University respectively.

 Describe activities you have undertaken that demonstrate commitment to your community, spirit of service, and/or give back qualities

The Service day is one of the most important moments of every MasterCard Foundation Scholar, and as a result, I never missed any. On the service day of 2016, I participated in the service day by volunteering to clean spaces at the Akropong School for the blinds in the Eastern Region of Ghana. Throughout the service program, not only did I clean areas on the campus but also got the opportunity to engage with talented blind students on their campus. From experiences and stories, blind students shared on how they are overcoming certain challenges in their lives with other senses apart from sight made me leave the place with a sense of fulfilment.

In 2017 and 2018, I celebrated the service day at Patang Psychiatric Hospital. I helped in fundraising, collection of food and sanitary items to be given to mentally challenged patients at the hospitals. My original intention was to spend the length of the service day at the school, but I rarely found myself leaving before 5 pm. I met a young person like myself who was struggling with drug addiction. And a big lesson I learnt through my engagement with him was that mental health is essential. He made me aware that due to drug addiction, there is very little he could control in his life, and it is hard to achieve his dreams of becoming a banker. Before I left his place, I encouraged him to take his drugs as prescribed to strengthen his weakening body and inspired him to be hopeful about achieving his dreams.

What followed in what an excellent opportunity to join in the campaign against uncleanliness in Ayigya Zongo. Ayigya Zongo is a Muslim community in Kumasi with over 10, 000 inhabitants with a higher number of Muslims than Christians. Due to poor planning of houses, a significant slum has been created which brings about filths in the gutters and leads to untidiness. As a commitment to promoting the 3rd and 6th Sustainable Development Goals of the United Nations, viz, Good health and wellbeing, and clean water and sanitation; I realized my strengths in community development by doing and encouraging the youth and children to join in the campaign and make Zongo communities clean. It was both a pleasure and responsibility to educate the elderly and youth on the repercussions of an untidy community.

Give an example of how you currently contribute to your community or show leadership. This could include serving as a role model to younger siblings or neighbours, or having a leadership role on a team, a community group or a club. Please describe your experience.

I have always found a sense of satisfaction to be involved in promoting proper sanitation in Ayigya Zongo community. The experiences I gained from volunteering on sanitation days and clean-up campaigns have influenced myself and other colleagues to establish a social venture called Motion Waste Management, which thrives on using tricycles to collect waste in the community for a fee. The amazing part of our value proposition is that we move into houses bi-weekly and offer sanitation education to people on ways to manage waste to avoid diseases. This project makes me feel so fulfilled because I am running a wonderful cause that creates employment for the youth and also promotes the wellbeing of the community. One thing that impressed me the most was the determination and commitment to making this a reality. The benefits of waste management exceed that of any financial gains - it is a fulfilment of my purpose in discovering opportunities in solving societal problems.

How do you see yourself making a difference to your community, to your country or to Africa in the future?

By pursuing a postgraduate degree, I am putting myself in a position which will allow me to put the skills I have acquired from my undergrad, leadership, professional job and community service to push other young Africans forward in education and profession. As an African, I look forward to contributing to scientific research and technology in Africa with my set skills and acquired knowledge. In addition, as a co-founder of BnB Initiative, a project which leverage on the usage of digital technology to help young children in the rural communities to gain access to quality education, it is one of my long term commitments to bridging the gap between education in the rural and urban communities in Africa.

 Please provide a statement of your mathematical and scientific interests.

Following my few failed attempts at obtaining a prediction model for a gas explosion in my senior year capstone project, I have come to realize the importance of studying Mathematics. In 2018, I was driven by the increasing numbers of gas explosions in Ghana over the past decade, to design a system that can help reduce the occurrence. Fortunately, with my skills as a computer engineering student, I built an IoT sensor device and a web application to monitor the concentration of leaked LPG within a region. However, it became challenging for me developing a prediction model that could tell when a gas explosion is bound to occur because I needed a profound understanding of empirical, physical-based and numerical models.

For the past one and half years, the project has been the single most important thing in my life. I have worked hard on it to be among the 50 selected projects out of 400 that contested in the DELL EMC Competition 2019. All of my life, I have never been so ardent on building a product like this; hence I engaged in a series of consultations with my project supervisors, and lecturers to know the way forward. They knew my interest in applied mathematics and programming so they recommended that I gain a deeper understanding of mathematics, notably, scientific computation, statistical mechanics, pattern recognition and dynamical systems, to achieve an accurate prediction model. With my short-term goal of becoming a systems analyst, the ambition to create a product that is beneficial to saving lives and also creating awareness for climate change have reaffirmed my decisions to take these recommendations seriously, and pursue a postgraduate degree in Mathematical Sciences with a focus on mathematical modelling, statistics and pattern recognition.

I initially pursued computer engineering because it gave my parents financial freedom as I was a MasterCard Scholar on a full scholarship. Besides, it was intellectually rewarding because I was also keen on using computers to write programs, an interest I developed while working in a neighbour’s computer shop before going to college. At Ashesi University, I was given opportunities to explore my chosen field of engineering, lead young people and impact others in a holistic way that would not have given my financial situation. Throughout my Ashesi experiences, I fed my curiosity and passion for engineering and mathematics through an intellectual journey and extracurricular engagements. I served as a Math Resource Centre Assistant, providing support to students who needed help in Calculus, Statistics, Differential equations, Python and R programming courses. Besides, I embarked on community service campaigns which empowered children and youth in three regions of Ghana by teaching them mathematics and leadership

Again, I had a lot of commitments that cemented my love for mathematics during my secondary school days. These were some of the experiences of being a vice-president of the Math Club and NSMQ team member helped push me into the engineering school, hence doing further studies in Mathematical sciences will grant me enough leverage to combine engineering and mathematics to reach the peak of my career.

Lastly, I work as a computer programmer, and I have been working on applications for air quality, automobile fuel monitoring, flood prediction, vehicle tracking, and revenue and tax collection. From my experience and future prospect of this field, I have realized that more profound knowledge in Mathematical sciences will be the most relevant and enjoyable set skill for the career I have chosen.

In your opinion, how are mathematics and sciences important to development in Africa?

Today, what has made the west and other continents more advanced is not only their colonizing power but the application of mathematics and sciences in various fields of development such as finance, engineering, medicine, transportation, agriculture, etc. In these developed countries, mathematics and sciences drive innovation and technology. To witness the best of development, Africans like myself need to build lasting roads, sustainable power supply, smart cities, more secured banking systems, reliable medical systems, better infrastructure, automated agricultural system, etc. to solve problems such as inaccessibility, load shedding, poor urbanization, floods, poverty, corruption, diseases, homelessness and hunger. In order to effectively tackle these problems, the education of mathematics and sciences should be intrinsically connected to everything in our African society through consistent investment.

Furthermore, as a tech enthusiast, the cost of internet data rate is very high in Africa, and this discourages research work on the part of students, leading to shoddy quality work and also unproductive results. We, therefore, require the study of mathematics and sciences to position Africa to catch up with the information and communication technology. This is because with mathematics and sciences, system analysts and engineers can devise mathematical models on waves and signals which can increase faster internet connectivity and utilize fewer resources. These same engineers with the skills of mathematics and sciences can create prediction models and systems that can aid in the prevention of possible dangers such as fire explosion and floods in our communities.

Again, the work of Angelina Lutambi, AIMS Alum and a senior research scientist is a testimony to the importance of mathematics and sciences in health care development of Africa. Through the knowledge acquired in mathematical sciences, she has been able to design statistical and computational models that drive public policy on health in Tanzania. Lastly, as many African countries seek to promote STEM education in schools, the teaching of mathematics and sciences is core to the development of the right set of skills for problem-solving.

Highlight what you believe to be the most important issue facing your country today. Please suggest possible solutions, for example economic, education, health care, or social or public policy intervention.

Flooding: It is one of the most frequent problems during the rainy season in Ghana. Each year, places in Accra and Kumasi record frequent flooding coupled with more devastating consequences, including death, loss of property, explosions and diseases. An example is the June 3rd 2015 disaster that happened at the Kwame Nkrumah Circle, Accra.

The solutions to flooding issues in Ghana include:

The development of a reliable large-scale weather forecast and early warning systems to study and process weather patterns to give advanced satisfactory warnings on the two seasons we experience in the country.

The second possible solution is the establishment of regional or community-based flood monitoring centres. These centres should implement a flood prediction system that can process precipitation data inputs using mathematical techniques such as numerical models to assist the officials of Town and Country Planning in the creation of infrastructure for homes and industries.

Development of drainage flows with the deployment of sensors is core to the eradication of floods. Since most flooding-reported cases are caused by choked gutters, waterways and channels in our various communities, these sensors can be real-time based to collect information about the daily status of the trenches, and stream flows in our communities. For instance, choked drainages can easily be noticed using sensors, and waste management officials can be informed to clean them before the rains start.

Describe a situation where you had to overcome a significant obstacle or challenge to reach a goal. How did you react to this obstacle or challenge? What did you learn from the situation?

The second semester of my third year saw my engineering team working on an automated fog harvester and automated irrigational system for Ashesi farms. Unfortunately, the leader of the group took a gap year due to illness, and I volunteered in his place to lead a team of five engineering students to design the system for the Ashesi Farms. While the team was designing circuit systems and electromechanical structures, I faced a challenge – a member of my team was breaking the cycle of dependability. He talked a lot and hardly ever executed any of the tasks assigned to him. He was not collaborative, did not display team spirit and excluded himself from general team meetings. His actions cost the team points during the mid-semester presentation because he was in charge of creating visuals for the team’s presentation.

To overcome this issue, I approached him, acknowledged his strengths and weaknesses, gave constructive criticisms and informed him on how appreciative the team would be if he increased his efforts. He eventually communicated his concerns to me, mentioning that factors such as poor academic performance and personal feuds with some team members caused him to lose interest in the team’s vision. I thanked him for his frankness and helped him structure an efficient study pattern. I also went further to organize an activity for the team, which helped strengthen their interpersonal relationships. He went on to lead team presentations; he made substantial progress in his academics and became a cheerleader for team spirit. Ever since then, I learned that it takes one person to believe in someone for them to change positively to reach their goals.

 Describe your aspirations for social change and how you plan to achieve social change through your career.

Two main things interest me when it comes to social change - improving disaster management and increasing the quality of education for rural communities. Each year, we hear it on the radio, watch the news on television and even read it in the newspapers about issues of floods, gas explosions, road accidents, the low performance of students who come from the rural communities, etc. and we take them for granted. In all these cases, minimal measures have been put in place to address this menace. Also, despite statistical data available on how severe this menace is, most of these data are not processed to find solutions. I aspire to use my knowledge acquired in mathematical sciences and engineering to help to create systems that the collection of data that leads to creation of possible solutions for disaster events like flooding, fire explosions, etc. I love to be a real contributor to quality education in rural communities by promoting the use of digital tools in the teaching of every subject. Even though some of these communities lack electricity, I intend to use my engineering set skills to build solar panels to power these technological tools to assist in teaching and learning.

Describe your previous volunteer experience

In the summer of 2019, I returned to Mponwaakrom, a farming community in the Bono East of Ghana as a co-lead for BnB Initiative, a project which covered three focus: the construction of a new nursery and test preparation space, a youth empowerment initiative to address school drop-out and teenage pregnancy, and the provision of educational resources to encourage student excellence. As a co-lead, I was very active and supportive in achieving all these milestones. (<https://binnkabi.netlify.com/>).

Before that, I had served the same community by teaching English and Mathematics to children and youth during a two-week community service with TMAT in 2017. This helped me establish a cordial relationship with the community elders while researching on ways to empower children and youth in the community. As I served in this community where there is no access to electricity, and other social amenities like hospitals and motorable road, my relationship with the people grew stronger because I was passionate in helping them solve their educational needs. This volunteer activities and experiences gathered cemented my decision to embark on this second community service.

While embarking on this project in 2019, I leveraged on my existing relationship with the community elders and teachers of the local school to communicate effectively and influence the elders in the community to support their wards’ educations to promote development. I also used the opportunity to unite and motivate other volunteers (students from Kwame Nkrumah University of Science and Technology, University of Cape Coast, Macalester University, Ashesi University) to be collaborative in the fight against school dropout, teenage pregnancy and illegal mining associated with children through an empowerment program held in the community. My past experiences and leadership experiences granted me the opportunity to supervise teaching materials or content during the empowerment program.

This was a tough but amazing project for me because I learned a lot about the people and myself too. Through this project, I empathized with victims of school dropout, teenage pregnancy and illegal mining, and influenced them on how they can still pursue their dreams despite their current situation. The best part was seeing volunteers sharing their stories and images of scholarly opportunities at their various universities to inspire the children and youth to action. Today, this has become a symbol of hope for the children and youth in that community, and I have been welcomed into a village far away from home, not by birth, but my commitment to serve.

Do you have any experience of working in industry? [Industry is here defined as private or public businesses, government, non-governmental organisations and civil society]. If your answer is "yes," please describe your experience

My interest in the Internet of Things and automated systems have always attracted me to working with organizations that enables me to build hands-on knowledge and skills in harmony with these interests. First, I worked as a Research and Design Intern at Burro Ghana to analyze the efficiency of removing palm nut fruits from its bunch for farmers in the Eastern Region, In this internship, I designed a 3D printed claw-shaped tool that increases removal process by 50% compared to the conventional way of palm fruit removal by hand.

I also worked on sensor technology projects with InventElectronics as an embedded system engineer where I applied microprocessor and microcontroller fundamentals to build on an existing project, Grainmate project, which aimed at enhancing grain moisture detector to reduce post-harvest losses in maize production.

Furthermore, in my current job as a computer programmer, I am often the lead in solving computational problems for computer memory utilization, backend and database logic. Working in this field have made me realize that mathematics and science gives me a competitive edge in the creation of powerful software applications

Do you have serious interests in or aspirations to working in industry immediately after graduating from AIMS? If your answer is "yes," please describe your interests.

It is one of my career goals to work in the industry after graduating AIMS. I want to apply my knowledge in mathematical sciences in organizations with a strong focus on hands-on experience hardware and software systems that solve the many Africa’s problems, especially, climate change issues and disasters, etc.

 Please provide a statement detailing your personal career goals and where you see yourself in 5-10 years' time.

I am fascinated by the trend of the technological system using statistical models and computations to predict the future of our world. In two to three years from now, my goal is to become a computational and systems analyst resolving global issues on climate change and disaster in Africa. However, that can only be possible after I ave acquired my Master's Degree from AIMS. Ultimately, 5-10 years, I hope to become a professor at AIMS Ghana teaching and also conducting research in areas such as climate change and disaster management in Africa.

What motivates you to apply for this programme? How do you expect to benefit from studying at AIMS?

I have always been motivated by the desire to pursue scientific research that enables the creation of systems that impact lives in our society. Working with data and making meaningful sense out of them using statistical models and mathematical computations give me such a great sense of accomplishment. I feel it is essential, both to me personally and my career as a system analyst. Personally, pursuing Mathematical sciences is not far from engineering, engineering even borrows concepts from mathematics. After perusing the course description, not only are the contents relevant and advanced but also they are also in agreement with the courses I studied in my undergraduate degree and also taken online. Thus, I can already see that some of the concepts that I will study will eventually help me succeed in my career. Due to this, I firmly believe that I can complete this esteemed program at AIMS successfully.

Choosing to enrol in the African Institute of Mathematical Sciences (AIMS Ghana) is a step in the right direction to achieving my goals and future aspiration because it has an excellent program with a unique focus on scientific research that will set me apart from my learned colleagues in my field of work and study. I hope to use my degree to further my understanding of mathematical concepts, develop accurate prediction models for monitoring and control systems, and also achieve my long term goal, thus, pursuing a Doctorate in Mathematical Sciences. I expect to utilize the campus serene and conducive environment, and its proximity to the sea to explore more about myself and Africa. I love the campus’ sizable community with amazing professors, students and research-focused external partnerships. I am ready to learn from them, offer my contribution to their works, and also expand my network. All these will grant me a holistic graduate school experience.