Phuntsho Norbu

I grew up in Bhutan, a developing nation that measures its well-being by Gross National Happiness. This speaks simply to the values central to my people and culture. We are altruistic, taught to lend others a hand and prioritize the whole, not the individual. These values, instilled in me, make me proud to be Bhutanese. We fiercely guard our traditional way of life, sometimes resistant to the change outside influences increasingly make inevitable. I've always had a strong desire to give back to and make positive change in Bhutan; long wondering how I would do this. College helped me see how my longtime passion for technology and "creating" could have that impact.

Tiny but a unique nation.

Growing up in a Buddhist society, we didn't celebrate gift-giving occasions. We siblings only received gifts for Academic Result Day because we performed well. My parents value education and passed that along to us. I loved to learn and worked hard in school. With consistent good grades, I always looked forward to my annual gift. Without fail, I asked for remote control (RC) cars; braking them apart to extricate the motors I would use to create other motorized devices. I began my inventor phase making mini fans, working my way up to small water pumps. I was and remain fascinated by motors and strongly believe the invention of the motor is as significant as that of the wheel.

At an early age, I developed a passion for building things and seeing how technology could add value to daily life. I constantly constructed and deconstructed things. My mother, a fertilizer company agent, distributed trucks of fertilizer during farming season. At fourteen, I watched her and elder relatives transporting 50 kilograms fertilizer bags on their back from trucks to the storage room. I made a wheelbarrow for more efficient transportation. Unfortunately, my contraption couldn't sustain the weight of the fertilizer and broke instantly. My mother appreciated my eagerness to build things and attempts to facilitate everyday tasks. Encouraging my innovative mindset, she let me dismantle all sorts of things – most of the time. I remember the day she spanked me for breaking the washing machine in an effort to claim its motor. In my defense, I thought the washing machine was broken. Back then, a washing machine motor was a trip to Disneyland. Despite similar occasions, I grew up being rewarded for my academic achievement and praised for my creativity.

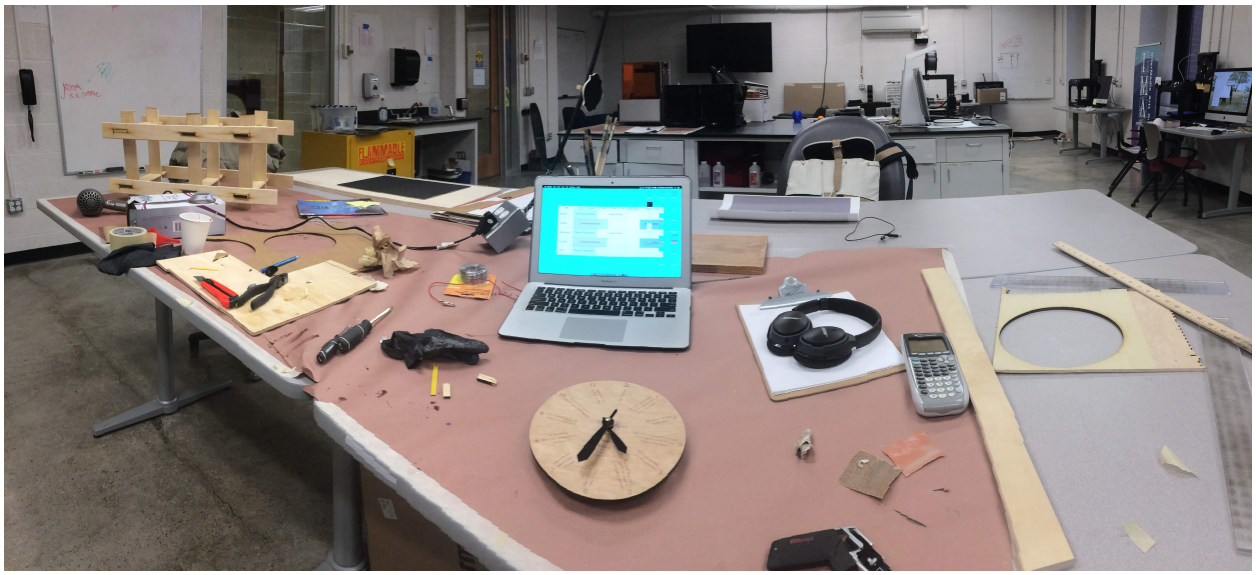
High school was a unique experience. Enrolled at United World College - India, where 200 students represented over 90 countries, my peers possessed intellect and knowledge I thought impossible at that age. The international curriculum was very different from Bhutan's so I had to re-learn the experience of high school. Even communicating in English became

problematic. Although I could speak English, understanding was often difficult. As a result of this adjustment, I underperformed in areas where I had once been the top of my class. My self-confidence deflated, I let the inventor part of me slip away for a time. I missed out on collaborating and learning from people with similar interests and sharing my creative side with my peers. To this day, when I post videos taken with my drone, my high school friends are surprised to see these not-so-new interests.

Although high school was difficult, it exposed me to different experiences and ways of life. With peers from all over the world, we were interested in one another's cultures. This showed me how useful cross-collaboration could be as well as the similarities of our issues. Unfortunately, two years went by swiftly and I never got to share my love for creating or pursue my interest in innovation and technology. Going into college, I hoped my passion would be reignited.

Although I arrived at Wheaton a humbler student, it was here that my creative spirit and confidence would soar again. Despite low grades in two calculus courses, I took cryptography. Though the class was challenging, the sense of determination I developed in high school combined with the team-based structure of the course enabled me pass with flying colours. While all of the math jazz was happening, I discovered the makerspace on campus, the only room that houses 3D printers, laser cutters and CNC routers. Back in Bhutan when I was building my little projects, I only had a set of screwdrivers, some wires and bits of collected machinery. Seeing this new technology and knowing it was at my disposal renewed my enthusiasm for future projects. With 3D printers I could make anything I wanted. My first 3D-printed object was *Jakar Dzong,* a famous architectural building in my hometown. The makerspace was an opportunity to realize my childhood dreams. By second semester of

freshman year, the makerspace was my second home.



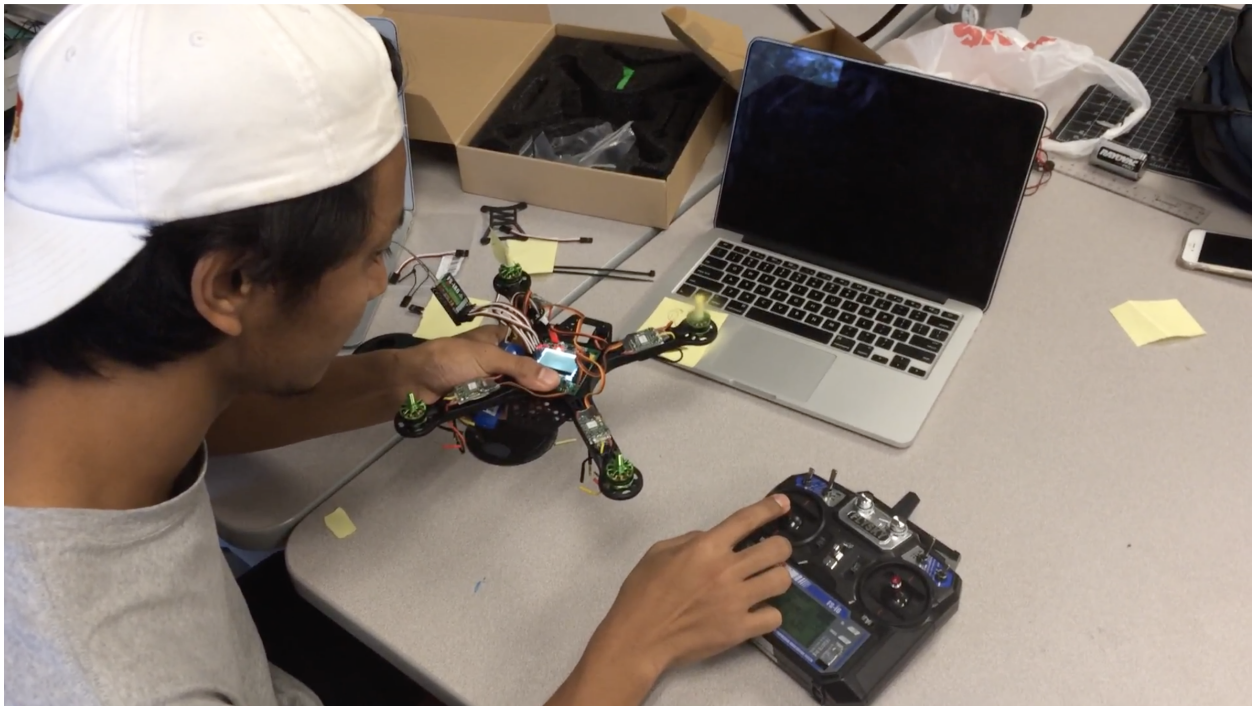
The campus MakerSpace

Soon two significant worlds were colliding for the first time: a love for building and academics. My technical competency was burgeoning as well. I remember having to laser cut a picture of a tree for my CS project. Although my peers were able to write the code to generate the tree, they couldn't use the laser cutter so I enthusiastically offered to teach them. These projects made me more academically ambitious and rekindled my passion for creating.

In this second home, I began working with motors again which gave rise to my love for drones. I had never used the devices before but decided to repair the motors of broken ones. I soon became the recipient of the campus' broken drone supply. Soldering the small motors required practice and especially patience given their size but the satisfying work yielded two functional drones. Intrigued, I stepped up my work with motors and began a drone-building project with a friend. After a month spent watching countless YouTube drone videos, we produced our first. During our maiden flight, I realized that our battery was wobbling but with the

3D printers I was able to produce an elegant and strong battery holder. I flew my creation for days, soon advancing from building, to flying, to shooting institutional videos with drones. I was captivated by my small quadcopter, yet to discover its true value.

When the Makerspace bought a DJI Phantom Pro with semi-autonomous flight, an HD camera and many other smart features, my imagination ran wild. I spent time researching drones, their capabilities and the impact they could have on rural areas like those in Bhutan. My mind jumped to memories of how local rangers struggled to track down illegal loggers and how replacing the regular camera with a thermal imaging camera on a drone would be an asset to their work. I researched the uses of drones in depth and was surprised by their many uses, like carrying medicines in rural areas. This made me think of life back home and of my grandmother buying medicine in bulk because of the lack of medicine shops in her village. I immediately knew drones could be used in Bhutan.



Testing if the propellers were turning in the right direction.

Beyond the opportunities I've had while in school, Wheaton has provided me an environment where the significance I place on collaboration and creativity is not only encouraged but highly valued. I am fortunate to hold leadership positions in various organization including resident advisor to secretary of club soccer and research assistant. These positions enabled me to combine extracurricular activities with technology and share my proficiency of different technological equipment with peers. RAs are required to make monthly door decs and bulletin board. I introduced my peers who believe they are not creative enough for this task to tools I knew could help. I introduced them to 3D printing and laser cutters. This ultimately led to even the office of residential life seeing the potential of such resources. The laser cutter proved to be particularly useful to Residential Life when I made gifts for RAs when the office's budget didn't allow for more expensive store-bought gifts. ResLife asked me to create these personalized gifts using the laser cutter. This wouldn't have been possible without the awareness of the resources available. I've been fortunate that Wheaton is a place that embraces collaboration making it possible for me to bring about small changes just by sharing my interests and lending my help and insight where I am able. In the same way I have been able to bring these small-scale changes, I hope to integrate technology to life back home at a larger scale and assist in that advancement.

From public school in Bhutan to a highly-competitive international school in India and then college in the US, I have seen different perspectives and can see myself returning to Bhutan to influence change at an important juncture. At Wheaton, I've continued to developed long standing interests and my understanding of the capacity of technology. Now more than ever, I see the real potential for me to direct my passion for creation and technology and put these to use, particularly drone technology at a time where Bhutan's development is intensifying my commitment to help its advancement efforts.