

Northland Drone Business Plan Competition

Overview

The Northland Drone Business Plan Competition (BPC) was a first-of-its-kind entrepreneurship bootcamp focused specifically on generating interest and opportunities for traditionally underrepresented communities in the emerging sUAS ecosystem. The BPC was supported under a subaward to Northland Community and Technical College (Northland) through Sinclair Community College, NSF ATE Program award #1902003, titled 'Educating Entrepreneurial Technicians for Unmanned Aerial Systems'. Sinclair was the host institution for the award, running the initial pilot BPC virtually in 2021, and again in 2022. The two subawards, Northland and Atlantic Cape Community College completed their BPC programs in 2022.

The Northland Drone BPC was held at the Mall of America on August 10-12, 2022, a part of the 5-day Experience STEAM hosted by the National Center for Autonomous Technologies'. The Drone BPC was a pre-registered a three-day bootcamp designed for students interested in two-year technical degrees, drones, and entrepreneurship.

The cohort consisting of 12 students ranging in age from 17-22, including ten BIPOC students, from low-income neighborhoods in Minneapolis. One participant recently relocated Afghani Refugee, and another from Rural Minnesota. Participation of working students was an identified barrier to participate in a three-day event. To alleviate this barrier a \$800 stipend was provided which also helped given constraints on the lack of a monetary prize. The Northland Drone BPC held at Experience STEAM has resulted in several organizations such as The Mall of America expressing support for continuing the effort.

This narrative discusses Northland's efforts to complete the scope of work, supporting documents, and lessons learned from the multi-iterative effort.

Executing the Northland BPC at Experience STEAM

The Northland Drone BPC was hosted at Experience STEAM at Mall of America on August 10-12, 2022. The Experience STEAM event presented a unique opportunity to host the Northland Drone BPC. With this approach, the Northland BPC would be collocated with a collection of 18 workshops and 14 camps at Experience STEAM. It was anticipated many Experience STEAM participants would be interested in UAS. Other Experience STEAM attractions included high-school FPV drone racing and VEX robotics competitions, the Federal Aviation Administration (FAA), Flite Test, a world-renowned sUAS building/flying influencer, and the Association for Uncrewed Vehicle Systems International (AUVSI), the world's largest trade organization dedicated to the advancement of autonomous technologies. Centrally located in the twin-cities at Mall of America provided a highly accessible and population-dense location to further encourage participation. Located in the heart of an entrepreneurial and sUAS community hub also enabled Northland to organize a truly impressive list of in-person speakers to grow the educational value of the Business Plan Competition.

A three-day BPC model was more aligned with the co-located Experience STEAM and was a shift from earlier visions for the event. This reduced time commitment allowed participants to attend other sUAS related camps. It was necessary to modify the approach to the BPC to accommodate the reduced duration. A three-day bootcamp format was decided as the best format to leverage the benefits of co-locating with Experience STEAM and still provide enough valuable content to merit participation. The first day would include a comprehensive overview of sUAS technology and policy, the second entrepreneurial theory, and the third day the actual pitch from participants. The original format would envision 15 speakers from the sUAS and Entrepreneurial industries to provide presentations and knowledge exchange with participants. For judges, Northland reached out to The University of Minnesota and University of North Dakota entrepreneurship programs to leverage their respective VC student associations (Atland Fund and Dakota Venture Group).

Proposed Schedule

Day 1 – Drone Industry Overview – August 10th	
Drone Regulation Overview	Kevin Morris (FAA)
Drone Hardware Overview	Logan Noess (Vertex Unmanned)
Drone Software Overview	Logan Noess (Vertex Unmanned)
Drone Use Case Overview	Tom Kenville (iSight Drone Services)
Autonomous Technologies Panel	Ethan West (Sinclair), Todd Colten (Sentera), Josh Riedy (Airtonomy)
Remotely Piloted Panel	Jay Christensen (JayBird Films), Mike Israel (Airvuz), Marty Weatherall (Hydra FPV)
End of Day Deliverable	Business Concept

Day 2 – Drone Business Plan Overview – August 11th	
Business Types	Kevin McKinnon (MN DEED)
Business Funding Sources and Resources	Kevin McKinnon (MN DEED)
Business Plan and Investor Pitch Deck Overview	John Stavig (U of M), Jeff Stamp (U of M), Paul Jackson (The Entrepreneurs' Center)
End of Day Deliverable	Executive Summary

Day 3 – Drone Pitch Deck and Presentations – August 12th	
Pitch Deck Review	Atland Fund (U of M)
Pitch Deck Presentations	Selection of Speakers
Awards	Selection of Speakers

Marketing and Outreach

Northland staff reached out to the two-year educators from the Minnesota State iteration in early June. Many of the instructors and students had left for the summer recess. Northland staff were not able to reach many instructors and had no practical way to get ahold of students outside school emails, which many don't check in the summer.

Given the challenges, Northland Staff changed communication and engagement strategies, and opened the BPC up to high school students interested in a two-year technical degree, in addition to the current two-year Minnesota State students already eligible. Northland Staff reached out to local non-profits and student organizations, but challenges remained in engaging students outside the traditional academic year. To augment communication outreach efforts, the Northland Drone BPC was highlighted on NCAT's Experience STEAM Social Media page on July 15th and July 25th. The BPC was also highlighted by Marnita's Table, our DE&I consultant.



The reception didn't meet anticipated levels despite widespread communication outreach. Two weeks prior to the event, the Northland BPC was still low on enrollment. The Northland staff modified the communication approach again. Northland Staff re-evaluated the Northland BPC as an opportunity to test a concept that was consistently emerging during the planning of Experience STEAM. How can NSF ATE, and Minnesota State use its platform in novel ways to

encourage education as an equalizer for economic and social prosperity. With this in mind, Northland engaged Marnita's Table who was already supporting Experience STEAM. Working with the nationally recognized equity and inclusion team at Marnita's Table. Intentional Social Interaction ("IZI") is Marnita's Table effective experience engineering model that helps individuals, businesses, NGOs and government agencies achieve equity and inclusion goals. The conversations with Marnita's Table led to, Asian Media Access, and other organizations which provide opportunities for traditionally underrepresented communities in STEAM. This is part of what helped inform the stipends for participants who attended the bootcamp.

The reception was astonishing. Within the last week before the event, the Northland Drone BPC registration rose from one to sixteen. Northland staff worked with the groups, particularly Asian Media Access to help coordinate transportation for the registrants to the event each day and organize food vouchers for the students. Of the 16 students registered, 12 attended the Northland Drone BPC. The twelve students included 10 BIPOC students from low-income neighborhoods in Minneapolis, one recently relocated Afghani Refugee, and one student from Rural Minnesota.

The Event

The event was an overwhelming success. The cohort consisting of 12 students ranging in age from 17-22, including 10 BIPOC students, from low-income neighborhoods in Minneapolis. One participant recently relocated Afghani Refugee, and another from Rural Minnesota. Only handful had ever been exposed to sUAS technology, with three having flown a drone and only one having owned one. Fewer had considered starting a business. Due to the ages of participants and their relative unfamiliarity with the concepts being taught, Northland worked with the guest speakers to create an adaptive curriculum to maximize the learning opportunity for the participants. The unique co-location at Experience STEAM facilitated a final speakers list that is astonishing in any venue, and unprecedented for the age level.

Day 1 – sUAS Technology		Day 2 - Entrepreneurship		Day 3 – Pitch Day	
Technology and Demo		ENTR Intro		sUAS Business	
FAA Airspace		Pitch Deck		Business Ideation	
sUAS Legal Framework		Pitch Deck Example		Business Pitch	
sUAS Business		VC Perspective		STEAM Carnival	
sUAS Business		sUAS Business		sUAS Building	

The first day was designed to introduce participants to small unmanned aircraft systems (sUAS) and show them the ‘art of the possible’ as students had little exposure to the technology. Logan Noess (Vertex Unmanned), the largest DJI distributor in Minnesota brought a variety of drones and sensors, using a mixture of videos and hands-on demonstrations to discuss sUAS underlying technology and concepts. A student favorite demonstration was when Logan instructed students to ‘write’ something on the table as he walked around with a thermal camera streaming to the TV. Students were able to see what they had ‘written’ show up on the TV as the thermal recognized the residual heat from where their hands had been. Alina George (Federal Aviation Administration) and Vernon Schurtz (AUVSI) then gave an overview of the FAA’s role in regulating uncrewed and crewed aviation while sharing personal their personal journeys to aviation. Alina shared her experience as a young person of color, and how her interests in science fiction influenced her to pursue a career in aviation at odds with her literature degree. Vernon shared experiences from his time on a submarine in the US Navy, and how his fascination with emerging technology led him to commercial UAS work then eventually as an advocate for the largest autonomous vehicle association in the world, the Association of

Uncrewed Vehicle Systems International. The day ended with two executive level speakers from drone startups based in the upper Midwest. Jenny Mirkovic (AirVuz) spoke about what it is like to be a female and a Chief Executive Officer of the drone media company AirVuz, and the opportunity to leverage UAS platforms as a method of storytelling. Tom Kenville (iSight Drone Services) shared what it takes to create a successful drone startup and his philosophy finding people to help execute a vision.



Thermal Image of Northland Drone Business Plan Competition Day 1

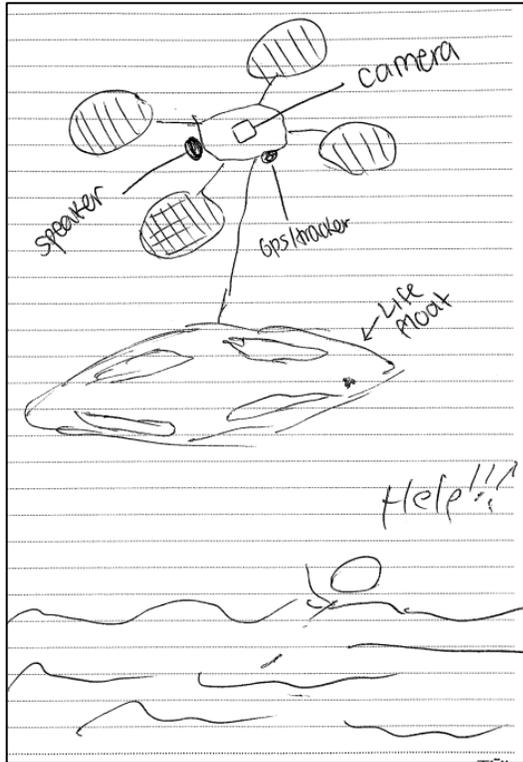
The second day was dedicated to the entrepreneurial process, outlining context and the framework by which concepts and companies can be designed. The first speaker was Dr. Jeff Stamp (Entrepreneurship Professor, University of Minnesota). Dr. Stamp focused on student engagement and creating a class atmosphere that encouraged involvement. He focused on how students can use their lives, knowledge, and experiences to find and create entrepreneurial opportunity. Dr. Stamp helped students understand the entrepreneurial mindset, and how to frame internal and external dialogue to uncover opportunity. Paul Jackson (VP of Strategic Programs, Entrepreneurs' Center) then taught students how to place their ideas within the framework of a pitch deck. Teaching the purpose of and literary framework of the pitch deck, Paul gave an overview of the Venture Capital fundraising process and the importance of cohesively and concisely telling your company's story. To demonstrate, Paul and Aaron Sykes (STEM Outreach Coordinator, NCAT) gave a mock pitch of a company. After the overviews from Dr. Stamp and Mr. Jackson, it was important to create credibility with the process. Rick Brimacomb (Founder, Brimacomb & Associates) was an original investor in the Minnesota-

based sUAS startup Sentera. Rick shared his experience in Venture Capital and specifics on working as an investor in the drone startup space. Rick spoke to the importance of evolving personally and professionally, particularly for the high-school age-group, and looking for opportunity where others see challenge. The day finished with Todd Colten (Director of Flight Services, Sentera), who shared his experiences ranging from Lockheed Martin to a drone startup and the process of working with Rick to secure funding.

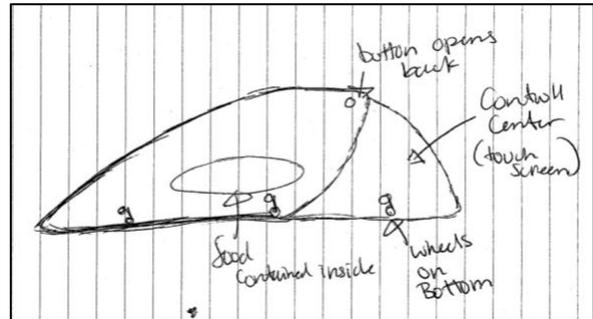
The final day participants had an opportunity to put the tools they'd learned into action. Northland worked with Marnita's Table to arrange the guest speaker Raji The One (ROQA Productions). Raji runs a Chicago-based multi-media brand who has worked with organizations like Under Armor, Nike, and Organic Valley. Raji shared his inspirational entrepreneurial story which resonated strongly with the participants. Raji focused how to use tools like sUAS to create impactful change and how authenticity is the cornerstone of a successful company.

The students then broke into groups, working together to create a company concept and elevator pitch. The four 'businesses' that were pitched at the end were highly reflective of their interests, experiences, and worldview. Fli-High Productions, a team of high-school athletes, envisioned a drone company flying racing drones amongst players at football games. A team led by a lifeguard pitched Life Drone, an autonomous drone that could drop a life preserver to patrol beaches. Another group created Party Polooza, a drone services company that used custom drones to capture social events for social media, allowing organizers to focus on the fun. A team whose mothers were nurses created an autonomous rover to deliver medicine to contagious patients, naming the company Nebari, which means 'Whale' in their home country of Malawi. Core to the design, Nebari resembles a whale to provide psychological comfort to a serious medical setting.

Life Drone



Nebari

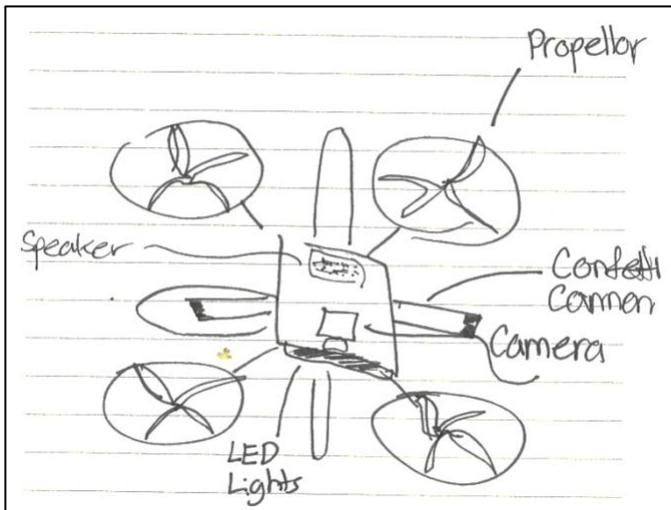
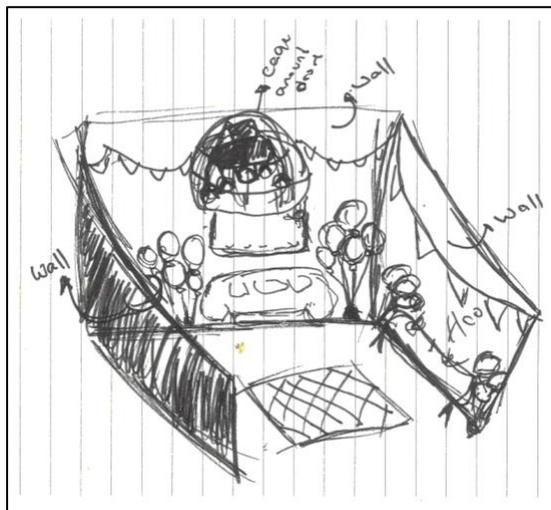


Version 1



Version 2

Party Polooza



After the participants pitched their companies, they toured Experience STEAM a 5-day outreach and engagement event which featured 57 organizations including academic, non-profit, and for-profit partners. Like the BPC, the vision of Experience STEAM at Mall of America was to inspire social and economic mobility enabled by access to opportunities inspiring students to consider emerging technology and technician career fields.

The final activity of the Northland Drone Business Plan Competition was to have the participants build their own drones. Northland partnered with Flite Test, where students build three drones, they could take home with them. Flite Test is an internationally recognized STEM industry leader who uses common items such as cardboard to build flying aircraft teaching important academic concepts while demystifying aviation to students.



The Northland Drone Business Plan Competition was a successful event. The metrics of success differed slightly from a traditional business plan competition, focusing more on experiential learning and concept introduction. The lasting value of the BPC is mental shift encouraged by creating an environment where critical thinking and curiosity were encouraged and providing tools for success. Armed with this expanded worldview, participants can reenter their communities with the methodology to create meaningful change.

From a technician standpoint, only three students had any real exposure to drones at the outset of the event. At the end, students had been exposed to a wide variety of sUAS platforms, sensors, and use cases. Equally important, they had the hands-on experience of building their own sUAS. Beyond the educational opportunity of building a drone, taking them home afterwards provides a unique chance to keep growing and start new conversations around sUAS technology and entrepreneurship.

Another large benefit to the format was the variety of highly qualified guest speakers. Students had an exceptional opportunity to speak with subject matter experts with a wide variety of experiences. Over the course of the competition, non-traditional education and diversity of thought/experiences was driven home as competitive advantages, particularly in the emerging-technology marketplace of unmanned aircraft systems. By facilitating meaningful and personal connections with the guest speakers, the BPC created a framework where students felt free to be themselves and pursue what interested them.



Prior Work to the Success of Northland's BPC at Experience STEAM:

First Approach Northland Internal Aviation and UAS Programs:

Initially, Northland and NCAT staff were going to host the Northland Drone BPC internally at Northland Community and Technical College. This format had been successfully implemented at Sinclair College for the 2021 virtual iteration. This was also the planned format for the 2022 Sinclair College Competition and the 2022 Atlantic Cape Community College Competition.

Northland planned to customize and build upon the extensive materials made available by Sinclair College. The Competition would be held in the Spring of 2022, using the same timeline as the concurrently run competitions through Sinclair College and Atlantic Cape Community College.

Challenges in First Approach:

Unlike Sinclair College and Atlantic Cape Community College, Northland Community and Technical College does not have a large student body pursuing degrees focused on Entrepreneurship. The lack of a strong connection to entrepreneurial pedagogy would require a significant learning curve for potential competitors. Students from the Aviation Maintenance Technician and UAS Maintenance Technician programs were not necessarily interested or inclined to participate in entrepreneurship experience opportunity. Additionally, the lack of a strong incentive such as winning cash prize or a co-located entrepreneurial center (Sinclair College) to help grow the business presented additional barriers for students with already busy academic and personal schedules.

For these reasons, it was quickly determined that Northland would need to search for a wider audience to engage in Northland Drone BPC.

Second Approach – Minnesota State 2-year schools:

Northland is part of the Minnesota State System. Minnesota State consists of 26 colleges and 7 universities with 54 campuses throughout the state. While Northland Community and Technical College is one of few colleges with UAS-centric degree programs, there are 23 schools with Entrepreneurship classes, with 16 of the schools being 2-year schools.

Northland created a master list of the schools and contacted all the schools in the Fall of 2021 to gauge interest in participating in The Drone Business Plan Competition. Schools in Green were interested in participating, red declined participating, and black no feedback was given.

Interested	No Feedback	Not Interested
Mesabi Range College	Anoka-Ramsey Community College	North Hennepin Community College
Ridgewater College	Hennepin Technical College	Minnesota State: Fergus Falls
St Paul College	Minneapolis Community and Technical College	
Southwest Minnesota State University	Minnesota State University Moorhead	
Winona State University	Vermilion	
St Cloud State University	Metropolitan State University	
Central Lakes College	Northwest Technical College	
Dakota County Technical College	Fond du Lac College	
Inver Hills Community College	Lake Superior College	
South Central College		

With several schools indicating interest, Northland set out to create a framework and rubric that would best accommodate schools across Minnesota State. To help reduce the barriers to entry identified in the first iteration of the Northland Drone BPC, it was decided to create a schedule that would coincide with an Introduction to Entrepreneurship (100 and 200 level ENTR) semester schedule. The logic was to create a business plan competition that would mirror the schedule of a traditional Entrepreneurship class. Entrepreneurship classes at this level have a semester-long business development project. By pursuing participants from these classes, the overall workload of a Drone BPC would be minimal, as students would be developing the materials concurrently for their registered classes. Scheduling was advanced so that Drone BPC deadlines would pre-date the anticipated enrolled-class deadlines. The logic would be that students could use the Drone BPC as a testing ground to submit and receive feedback on their materials before submitting them for a grade as part of their concurrent Entrepreneurship Class.

With this, the largest remaining challenge would be to encourage students without an autonomous technology background to elect to create a drone-centric business for their enrolled classes. To encourage participation, it was determined to create an attractive non-cash prize for the winning member. Northland and NCAT coordinated with Sinclair and identified a supported trip to AUVSI in Orlando of April 2022 would be an attractive prize. Although students may have limited knowledge of the sUAS industry and may not ultimately pursue the business outlined in the BPC, a trip to attend the largest trade show dedicated to advancing autonomous technologies could provide a large impact for aspiring entrepreneurs.

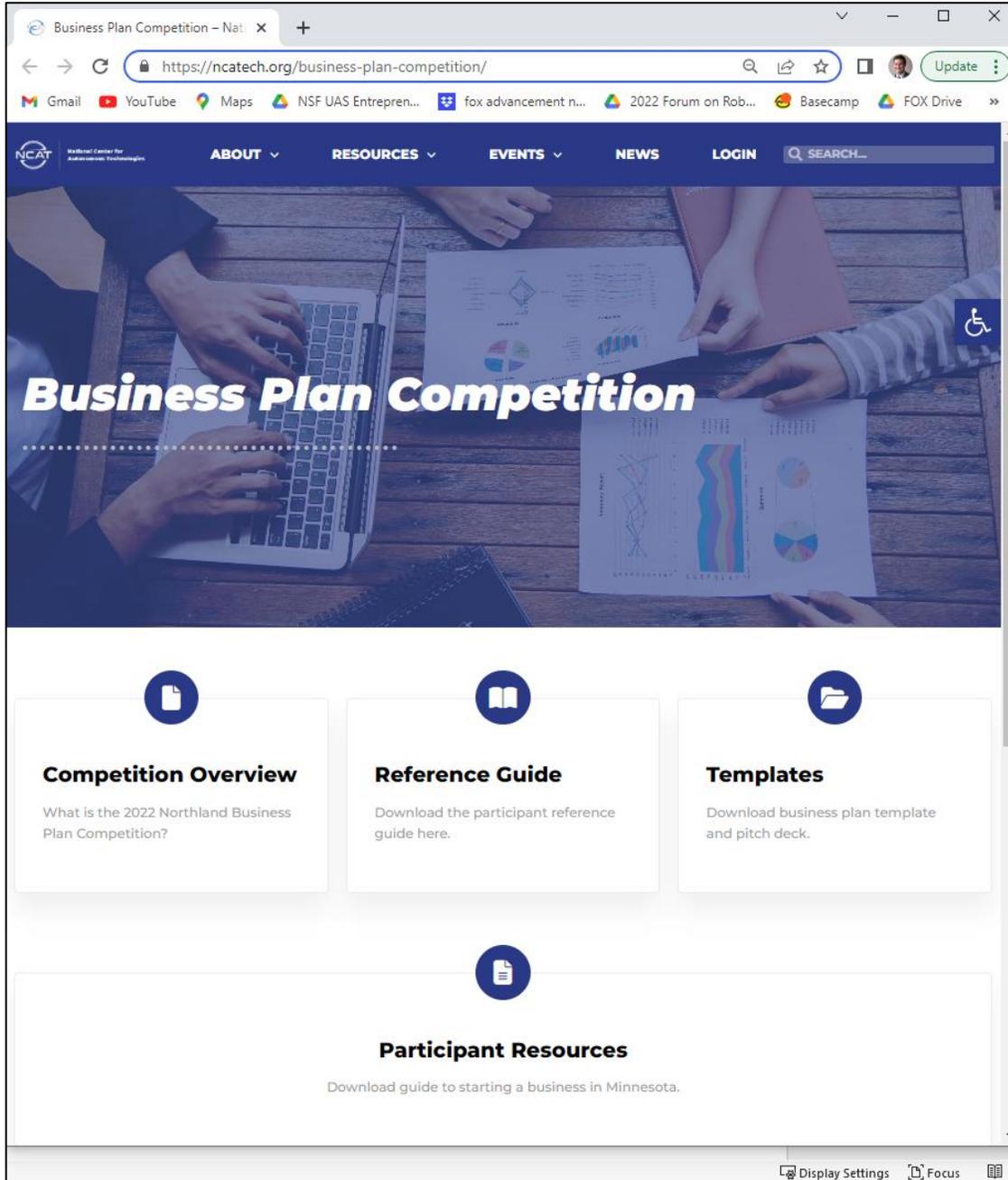
In December 2021, Northland Staff attempted to re-establish connection with the two-year schools who had indicated interest. However, contact was attempted after most classes had

wrapped up for the Fall 2021 academic semester. After the start of spring semester, contact was re-established with the schools. Many of the instructors who initially expressed support for the initiative were difficult to get in contact with, and we weren't able engage and integrate the concept to students in their classes. Difficulties included not having a large prize incentive and integrating into grading rubric. Much of the communication was done one-on-one and time consumer. In hindsight, if there would have been a short project pitch video that teachers could have emailed to students, it would have helped immensely. Instead, Northland was giving presentations to individual classes on the drone business plan competition. With the limited marketing, and other challenges, there were no students that submitted proposals for the spring planned Drone BCP outlined below:

Activity	Date / Deadline
Competition Opens	January 10 (First Day of MN STATE Classes)
Elevator Pitch Submission	February 11
Virtual Pitch / Finalist Selection	February 15
NCAT Virtual Instruction	February/March
Finalist BPC Document Submission	March 21 (Monday after Spring Break)
Finalist Pitch Event	April 4-9 (3 weeks before AUVSI)
Finalist Award Event	April 24-28 (AUVSI Xponential '22 Orlando, FL)

A Northland Drone BPC landing page was created on the NCAT website to intake Drone BPC submissions. This added a very professional aspect to the Minnesota State iteration.

Northland Business Plan Submission Website



<https://ncatech.org/business-plan-competition/>

Challenges in Second Approach:

The Minnesota State iteration ultimately was not successful because there was not a strong value proposition to students for participating. The shortcomings were the lack of pre-existing relationships with the educators in entrepreneurship community, engagement of faculty and students during COVID-19 impact and off semester cycles, and ultimately the lack of a cash prize incentive.

Lessons Learned for Future Planning:

The background of participants represented a very culturally diverse set of individuals. Getting them comfortable to open up led to the interesting discussions and conversations that gave the Northland BPC such value. It was not easy to create that environment. Simply put, the life experience and worldviews of the students were very different than the guest speakers and some of the cultural and age disparities led to challenges with the guest speaker engagement and presentation relatability. Three speakers did a phenomenal job overcoming these engagement obstacles, Alina George (FAA), Jeff Stamp (University of Minnesota Entrepreneurship), and Raji the One.

There were a few things that contributed to their success

- They focused primarily on student the students, putting engagement on par with content.
- They asked a lot of questions to encourage active participation. Different than other presenters, they waited through the silence for an answer, rather than answering their own question.
- They brought a lot of positive energy to their presentations.
- They focused heavily on creating connection, particularly recognizing the extent to which culture influences people. Alina and Raji spoke to their experiences as BIPOC individuals working in the sUAS industry while Stamp used his acknowledgement that the student's experience was different than his own to create understanding.
- Most importantly, they were willing to be vulnerable. Whether it was relaying heartfelt failures or even just acting a little silly, it lowered the teacher/student barrier to a point where students felt free to engage.

Ice Breakers and Initial Engagement could have been enhanced at the start of class:

At the beginning of the Northland BPC, students were given a before-event survey, a verbal overview of the event, and then the first speaker began. In hindsight and lessons from Marnita's Table IZI program on intentional interaction, more steps to lower anxiety, cultural, and social barriers would have initially created a better atmosphere where active participation and questions were more comfortable. By approaching it more professionally, we had to wait until students found comfort on their own before hearing their great perspectives. One speaker, Raji,

suggested vocal exercises like musical performance area powerful tool to getting young students talking and engaged.

The other primary modification would be to focus on an elevator pitch, rather than a pitch deck. The BPC students were very bright but had never been exposed to entrepreneurial theory and didn't have a frame of reference beyond the show Shark Tank. Paul Jackson (Entrepreneurs' Center) suggested most of the entrepreneurial education focus on an elevator pitch. At the students' entry level, it is more easily understood, they've seen it before on Shark Tank. Most importantly, the format maximizes the student's creative skills in thinking of a business but doesn't punish them for their unfamiliarity with the formal VC framework of a fundraising pitch deck.

Next Steps

The feedback from the Northland Drone Business Plan Competition was overwhelmingly positive from the students, speakers, and stakeholders. Speakers expressed gratitude for the opportunity and willingness to participate in future iterations. Mall of America expressed interest to participating in future iterations of the concept. Additionally, conversations have brought to light pre-existing organizations available for collaboration such as ILT Academy in St. Cloud. There may be an opportunity to integrate entrepreneurial concepts or modules into the DRONETECH framework produce by Northland.