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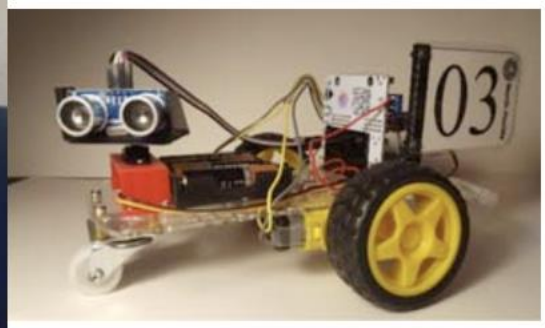
NFC STEM SEALs completes first year, looks forward to 2021 Summer Institute

Even in the midst of a pandemic, the teaching and learning of STEM was achieved. Students were engaged with new challenges and skills. The STEM SEALs team is very optimistic about the coming year and is busy preparing to launch a full Summer Institute in 2021 with the addition of robotic boats and drones to be able to fully accomplish its mission of SEA, AIR, and LAND Challenges for rural middle school students



Summer Institute STEMS SEALs Photos. -NFC Photos

Kim Scarboro, Director of College Advancement

MADISON, FL - STEM SEALs a National Science Foundation (NSF) funded research multi-year project at North Florida College (NFC) recently completed its first Summer Institute. The STEM grant focuses on developing and implementing a program for rural middle school students in remotely and robotically controlled vehicles for sea, air, and land, hence the SEALs label. The grant's aim is to promote greater awareness of STEM pathways, increase readiness of area students for STEM post-secondary study, and to build student skills and confidence in exploring STEM training and careers in the surrounding counties of Jefferson, Madison, Hamilton, Suwannee, Lafayette, and Taylor.

While the Summer Institute commenced in July, work on the program began quickly after the grant was officially awarded in April of 2019 and involved a collaboration of NFC college experts, area educators, and STEM professionals. Many STEM robotics programs use market ready devices, STEM SEALs takes a novel approach to building its own program and the materials they utilize. Unique prototypes were designed and tested - especially regarding the land rovers and robotic boats.

An integral part of the program is utilizing the talents and skills of individuals and resources at the college and its surrounding counties. Specifically, many of the component parts of the robotic devices are 3D printed, laser cut, or milled in the Advanced Manufacturing and Technology lab at NFC. In the Fall of 2019, a team of educators commenced to participate in Design Team workshops to further help develop the prototypes and learning activities that would be used in the Summer Institute with students.

Then in the Spring of 2020, STEM SEALs visited area schools where a total of 90 teachers were given the chance to help review and engage in a small sampling of the developed learning modules. Each participant in the Review Team process was given a micro:bit – the small microcomputer that is used to control the STEM SEALs robotic devices - and taught some basic coding to implement simple commands. Feedback from this process was utilized to further refine and enhance the learning activities and resources.

After the review process, the STEM SEALs NFC development team began working to finalize what would be included in the first inaugural Summer Institute involving students immersed in autonomous and remotely controlled robotic devices. The event would take place on campus and involve up to 48 students. Then the Covid-19 pandemic struck, and along with it - the uncertainty of how to implement the program and uphold strict distancing measures to ensure the safety of participants. The result was a scaled down Summer Institute that would only involve the LAND Challenge and robotic rovers. Recruitment for the first camp was limited to teachers who had participated in the Design or Review Team process and students with whom they were already in close contact such as their own child or a close relative. Rover kits and activity manuals were mailed or delivered to each participant and the camp was held virtually July 8-17 for 29 participants including teachers and students. Daily meetings were scheduled on Zoom with an open forum to allow students to access readily available help from the NFC expert team as needed. Teachers served a dual purpose of helping to coach their student and completing the learning modules themselves. Students and teachers, first learned to use and code the micro:bit, then they had to assemble the rovers, and finally to work through modules on how to control and move the rovers.

The final piece of the Summer Institute involved students competing in a competition to exhibit their rover and implement the skills they had learned throughout the camp. Taking into consideration the safety of those involved, alternate arrangements were made for the competition. Using the cafetorium provided by James Madison Preparatory High School, students were scheduled over a two-day period to compete. The competition was filmed and broadcast live so that students could watch as others competed. Competition winners and closing remarks were given in one final Zoom session late on Friday, July 17 wrapping up Year 1 implementation of STEM SEALs.

While the students who participated have returned to their normal school schedules, the NFC STEM SEALs team including the research and evaluation teams have moved again into develop mode. As they glean information from the data and feedback gathered throughout the first year, they will continue to refine the STEM SEALs program with the help of the Year 2 Design Team which met for the first time on October 17. Even in the midst of a pandemic, the teaching and learning of STEM was achieved. Students were engaged with new challenges and skills. The STEM SEALs team is very optimistic about the coming year and is busy preparing to launch a full Summer Institute in 2021 with the addition of robotic boats and drones to be able to fully accomplish its mission of SEA, AIR, and LAND Challenges for rural middle school students.

*If you are interested in collaborating, contributing, or participating in the STEM SEALs program contact: Lura Murfee Sapp / Project Coordinator
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