

Grant Proposal

Margaret Kreider

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The University of Akron

**Current Educational Enviornment.**

Ohio Virtual Academy (OHVA) is an online charter school that has an enrollment of over 15,000 students from all over the state of Ohio. The Middle School at OHVA has 6<sup>th</sup> through 8<sup>th</sup> grade students. There are 3685 diverse students enrolled in the middle school, 1,300 of those have are students with special needs. The teachers deliver live lessons throughout the day using Blackboard Collaborate Conferencing software. Each student is provided with a laptop computer, printer and high speed internet access. They are required to attend all live sessions and complete the online lessons and assignments in a timely manner. The students are responsible for spending at least 5 hours engaging in the online content each day.

Each student and their learning coach, usually a parent or grandparent, has been trained in how to use Office 365 software, the Learning Management System and the conferencing software so that they will be successful in this online environment. The students are required to attend all live classes during the day. They are to interact with the online lessons on their own and watch all videos, work through all examples and practice topics before coming to class.

The Middle School has teaching teams at all grade levels. Each team has a math, language arts, science, and history teacher. There are two intervention specialists assigned to each team. There are no more than 200 students per team. Each intervention specialist has no more than 24 special needs students. The intervention specialist is expected to differentiate the lessons that are provided online and in live sessions to help all special needs students to grow in their knowledge. Many times the curriculum and live sessions move to fast for these students and the intervention specialist is given the task to design lessons at their student's different skill levels.

Each middle school teacher has been trained in how to effectively use the online environment to keep students engaged. The live sessions are filled with student collaboration, discussions, and interactions. The teachers are seasoned professionals who have been teaching online for over 3 years. Each teacher's interview process includes an assessment in using different technology tools. The assessor asks for examples of an online lesson and how they will keep the students engaged. There are many professional development opportunities for the teachers to keep their technology skills sharp and to learn about the new tools available to help students with the skills they need to be successful in the 21<sup>st</sup> century.

Skills that students need to be successful in this age of technology are outlined by the International Society for Technology in Education Standards for Students. (ISTE) Students need to be innovative designers, computational thinkers, and creative communicators. Our online environment stresses the creative communicator skill. According to ISTE a creative communicator is a student who is able to communicate clearly and creatively. They are able to use different technology tools and platforms to show others what they know. At Ohio Virtual Academy Middle School, we encourage the students to choose the way they deliver certain assignments to show mastery. Students use audio recordings, video recordings, slides, or graphs and charts as a final product to show their knowledge. The students are able to work in groups to collaborate during live session classes. They can use the conferencing software to set up meetings at other times during the day to collaborate and they can use Microsoft OneDrive to work on projects together in real time.

**Limitations:**

Students at OHVA Middle School have many opportunities to improve their technology skills by practicing using the various software programs offered by Microsoft. The learning management system does not give the students tasks for them to experiment with testing the solutions to the problems they encounter. Being a computational thinker is one of the 21<sup>st</sup> century skills that the students need to develop. Teachers are implementing situations and simulations for the students to enhance this skill, but do not have the time to spend to develop these lessons. Teachers at OHVA are using third party websites and premade curriculum to help enhance the online curriculum that is available at OHVA.

Special needs students do better when they are able to use alternative methods to help them learn the content that the curriculum presents. Many of these students thrive in a subject when they are able to produce projects or work together to produce something that will solve real world problems.

The students who are enrolled in The Middle School at OHVA are from all parts of Ohio. They are able to come together in classes using the virtual classroom in Blackboard Collaborate. The students are isolated from their classmates because of the different cities and towns where they live. The students who are in each team are not sorted by geographical region. Some students in the team could be from the north eastern region of Ohio and other could be from the western or southern region. To overcome that feeling of isolation, OHVA offers many face to face opportunities across the state for the students to have human interactions. The students are encouraged to choose four face to face outings per year to participate.

**The Need:**

Special needs students at OHVA need to have a rich online curriculum that gives them the opportunity for creative thinking, hands on experiences, problem solving, and collaboration with classmates. The online learning management system gives the students a good starting point when learning different content. But, the curriculum does not go far enough in helping the students develop and practice the skills that the ISTE says they need to be successful. The students should have the opportunity to use the technology they have at their fingertips to work together to design and test solutions to problems or in other words be an innovative designer. Special needs students struggle with the general curriculum and often fail without support from an intervention specialist and different, more hands on projects.

Planning and designing supplemental lessons to accompany the general curriculum that requires the students to solve problems using collaboration and creative innovative designs takes many hours and expertise that the teachers do not have. The students need to have the opportunity to use critical thinking and be creative to solve some real life problems using the technology that they use every day. They need to learn how to use this technology in different ways to help them grow and develop their knowledge to be successful in the 21<sup>st</sup> century.

The Lego Company has designed curriculum using their Mindstorms eV3 line of bricks, gears and motors to aide teachers in bringing hands on problem solving, engineering design process and collaboration to middle school. Through this curriculum 24 students will design, build, program and test robots to do a variety of tasks. They will learn how to control motors and collect data to make decisions about their design. These lessons are aligned to meet common core standards and ISTE student standards for learning in the 21<sup>st</sup> century.

**Goals of the Proposal:**

The goal for this proposal is to seek funding from the Martha Holden Jennings Foundation to purchase the Lego EV3 Mindstorms classroom kit for one 7<sup>th</sup> grade team of special needs students (24 students). The main goal of this purchase is to support special needs students by providing them with materials to help them use critical thinking and collaboration to engage in problem solving skills using concrete materials.

The instructional goal of this proposal is to provide the special needs students with a curriculum that encourages creative problem solving, collaboration, and using technology to obtain the skills that they will need to be successful in future years of education and in their career pathway. The Mindstorms curriculum is designed to promote the skills that are present in 21<sup>st</sup> century learning. The curriculum uses engineering processes, math concepts and various technology solutions for the students to build real world solutions using robotics concepts.

### **Technology Proposal:**

The EV3 Mindstorms curriculum includes a set of materials that includes Lego bricks, programmable motors, gears, wheels, springs and rechargeable power packs. The software for coding and all the lesson and assessment materials are delivered online for free. There are online tutorial videos for the teachers to view and share with their students to help them get started. The students who are enrolled at OHVA have the needed computer technology and the high speed internet connections they need to access the software.

Each student would need to be provided with the EV3 Mindstorms Student Kit. The kits are designed to accommodate 2 students, but, because these students are not all in the same geographical vicinity, each student would be provided with their own kit. The students would still work in pairs, using the virtual classroom, to complete the tasks that are presented by the

teacher. After the completion of each category of the curriculum, the students will travel to a central location in Ohio for a face to face meeting to show their creations to their classmates and their parents.

### **Budget:**

The budget for this project is as follows: This is a one time purchase.

<b><u>Item</u></b>	<b><u>Amount</u></b>	<b><u>Single Cost</u></b>	<b><u>Total Cost</u></b>
EV3 Mindstorms Classroom Kit	1	\$4110.00	\$4110.00
Parent Association Contribution	1 time	\$2000.00	-2000.00
Fund Seeking Amount			\$2110.00

Each student would receive 1 kit to use for 1 year. The student's learning coach would be charged a \$100 deposit for the kit. The deposit would be returned, at the end of the year, when the complete kit is returned.

### **Timeline:**

The project will adhere to the following timeline for implementation:

March 2019	Survey 6 <sup>th</sup> grade special needs students for interest in the program
April 2109	Compile results and plan curriculum pace
May 2019	Purchase and organize kits
August 2019	Contact 7 <sup>th</sup> grade parents who showed interest in program
September 2019	Collect deposit and send kits to families. Give instructions to get started.

Oct. – Dec. 2019	Work through lessons. Plan a face to face meeting to showcase projects.
January 2020	Evaluate success of curriculum. Make changes if necessary
Feb.- May 2020	Work through lessons. Plan a face to face meeting to showcase projects.
June 2020	Collect kits from students return deposit money.

**Evaluation and Assessment of EV3 Mindstorms project:**

Each lesson has student peer assessments and discussions for the class. They will gather data and share their results. The results will either show success or failure of solving the problem. Teacher feedback will be ongoing to direct the students on their progress. Skills assessment will be done by student presentations and observations.

Student and parent surveys will be conducted at the end of each semester to gather data on student learning and satisfaction. Results will be analyzed and adjustments to the project will be made if necessary.

**Teacher Qualifications:**

I have been an educator for 18 years. I have taught middle school math and science in a traditional school. The last 4 years of my teaching career has been teaching 7<sup>th</sup> grade special needs students in an online environment as an intervention specialist specializing in math. I have a Bachelors of Fine Arts in Graphic Design, Bachelors of Education in Middle School Math, Science and Reading, Masters of Science in Curriculum and Instruction, and working on a Master's of Science in Instructional Technology. I have been designing interactive online lessons for special needs students for 4 years. I am able to design lessons that are at the correct skill level for each student to be successful. My graphic design background and instructional design



training has given me the needed experience to facilitate lessons rich in problem solving situations. I am able to guide and direct the diversity of student learners to get the most out of educational content. I believe that the EV3 Mindstorms curriculum will benefit the diverse needs of the special needs students who I teach. They will improve their communication skills, collaboration skills, and use their creativity to learn math, science, and engineering concepts to be college and career ready.