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A New Way to Educate:

Utilizing Technology in Schools to Lead America's Future Generations to STEM Careers

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The prominent education method used in the United States has remained mostly unchanged for the past 70 plus years. The method involves a teacher instructing a student, then reviewing the student's retention of the lesson in the form of a quiz or a test. Time has passed and though our world is evolving and changing, our education methods are lagging behind. Our students are experiencing more stimulating interaction than ever outside of school, and are pulled back in time when they go to school. This has led to disinterested youth and a short fall in the undergraduate enrollment and Science, Technology, Engineering and Math courses, also known as STEM.

As a result of this educational shortfall, American students are lagging behind other developed countries. In a 2009 international exam given to 15 year olds, the United States ranked 13th in science and 17th in math (Fleishman, et al., 2010). According to ACT, Inc. (2011), an effect of this staggering statistic on how behind our high schools are is only 45% of our high school graduates are ready for college level math and only 30% are ready for college level science. Of the students who are proficient in math, only 61% are interested in pursuing STEM careers, putting the United States behind 26 other countries with the number of students seeking undergraduates in Science or Engineering (Organization for Economic Cooperation and Development, 2010). The long term consequences of this will be far reaching, with a projected three million person shortfall in qualified personnel in STEM related Fields by 2018 (Carnevale, Smith, and Srohl, 2010). The significance of this is already being felt today with one in four physical scientists working in the United States not being born in our country (Carnevale, Smith, and Melton, 2011).

Finding a Solution

Invoke Technology believes the solution lies in a more in-depth look at the education system. A good amount of thought has been given to content, but not enough has been given to the delivery method. Today's youth are not the youth from the past and live in a more interactive and engaging world. With the level of stimulation they receive on a daily basis, the traditional classroom environment leaves the youth of today longing for interaction and an engaging educational experience.

Invoke Technology desires to study the effect technology has on student interest in STEM subjects and career fields. Many schools have a stand-by approach with technology being a parallel asset that stands alone and is often partially utilized. The optimal situation is a stand-with approach with technology being incorporated into all aspects of the school. D.E.S.C. or Defining Education through Student Computing is the research project Invoke Technology proposes.

DESC

The DESC project is based on the knowledge that our students need a more engaging classroom. Through this research we will better understand how technology affects students' desire and ability to learn. The test school will have one to one computing for all students, use the DESC platform as well as the DESC curriculum, and allow and encourage the use of DESC approved games. These components together will make the classroom more efficient, engaging, and interactive. The program involves bring innovation into the classroom and engaging our youth in the time they are in school to motivate them to learn by meeting them on their grounds. With an engaged youth who is excited about learning, we expect to see an increase in scores and enrolment in STEM majors, and have a more technology literate youth.

The DESC platform will be a content delivery system that gives students access digitally to class syllabi, due dates, grades, school activities and other school related items. The DESC program will automate mundane tasks so teachers can focus on the students and help them achieve their potential. The DESC platform will give teachers and students instant results from assessments. The platform will allow teachers to load questions and administer tests and quizzes. When the students are finished testing, the platform will grade and log the results while also giving the teacher instant access to important data. Charts and graphs will be produced that will show teachers learning gaps by student and by class. Without the need to grade tests by hand, teachers will find they have more time to spend with students to address learning gaps, find more engaging lessons, and to use more games to help students learn. With a more efficient learning environment, teachers' precious time will be used more effectively.

Schools that are part of the program will also have access to DESC curriculum. Our prepackaged content will be an invaluable resource to assure lessons are meeting current state standards. Invoke Technology staff has noticed discrepancies with the level of education from state to state. In order to help bridge the gap, our curriculum development team will put together

a curriculum calendar that schools in the program will be able to use to meet the highest standards. This will help guide teachers to cutting edge specific content, games and other activities that can be used to engage the students.

One to one computing will have a number of other impacts as well. Career exploration is one. With access to career exploration programs, the number of students seeking a STEM related career field will be impacted. According to a survey of 1,004 teenagers, (Intell, 2011) when informed about how much money they could make and what exactly they do in the STEM field, 50% of those surveyed said they would be more likely to consider a career in those fields. Another impact one to one computing can have addresses the concern with the number of books students carry to school and the medical impact this has. With digital text books, this concern will be alleviated, and will also give students the most up to date version of those textbooks. Another benefit is competition can be used as a great motivator. With one to one computing, students interested can pit their overall test and game scores against their class mates. Teachers can also encourage classes to help each other gain a higher score than other classes to make learning even more fun.

Conclusion

With the need for a STEM capable workforce in mind, Invoke Technology has come up with a creative solution. Through this study we believe we will see huge gains in the number of students interested in STEM related careers, as well as an overall increase in mastery across the board. All elements of DESC combine to form a program that will create a new and interactive learning environment. With all the stimulating interaction students have outside of school, it only makes sense that the school system meets them on their ground, rather than asking them to regress. This program takes out the guesswork for schools, giving them the tools and training they need to educate our students of tomorrow. Educational games as well as interactive lessons, projects, and assignments in class will go a long way to show kids that math and science can be fun. Invoke Technology's goal is to change the classrooms in America in a dynamic way to encourage our students and enhance their path to a successful and productive future.

What will it Cost?

Invoke Technology is proposing a two year study following students in a test school. The staff will include a project manager, two curriculum experts, and one software specialist. The cost for the two year study is estimated at 1.5M. This is allowing for \$680,000 for personnel; \$520,000 for needed hardware, software, infrastructure, and development costs; and \$200,000 for after school teacher training, activity bus usage, and other administrative costs. The test school will retain all hardware, infrastructure and licenses purchased with the project..

Works Cited

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Resumes

John R. Johnson III, President Invoke Technology

Recent Employment:

2D153, Colorado Air National Guard, Buckley AFB, Aurora, CO	11/03 - Present
Electronics Technician, US Forest Service, Monte Vista, CO	04/11 - Present
LMR Engineer, NANA Pacific, Colorado Springs, CO	01/09 - 11/10
J-6 Task Force Gator, Louisiana National guard, New Orleans, LA	04/08 - 01/09
Computer Technetium, Barrister Global Services network, Hammond, LA	01/07 - 04/08

Rachael Johnson, MSC, Licensed School Counselor

Recent Employment:

Middle School Counselor, Monte Vista Middle School, Monte Vista, CO	08/11 - Present
Middle School Counselor, Fountain Middle School, Fountain, CO	08/10 - 5/11
Counseling Intern, Douglass Valley Elem./Eagleview Middle, CO Springs, CO	10/09 - 5/10
Co-Teacher of Summer Program Lifting Off Academy, Colorado Springs, CO	05/10 - 7/10
Enrollment Counselor, Team Lead University of Phoenix, Colorado Springs, CO	03/08 - 10/09
Teacher, Cheyenne Mountain Charter Academy, Colorado Springs, CO	08/07 - 2/08
Special Education Paraprofessional, St. Cloud School District, St. Cloud, MN	02/07 - 7/07