ACADEMIC PAPER

ENTREPRENEURSHIP IN CYBERSECURITY

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Introduction

Science, technology, engineering, and mathematics (STEM) fields are in higher demand than ever in today's workforce, and having a diverse population of qualified STEM workers is essential to long-term economic growth in our country. Technology advances by the minute and non-STEM employers are scrambling to fill positions with more STEM candidates. The problem that we have is that, there are not a high level of participants in STEM curriculum. In order for us to be competitive in the technology driven global markets, this number will have to increase. Contributors to these problems are that teachers lack motivation, industry demand is higher than the supply, lack of diversity, and a segregated approach to the subjects in the classroom. The K12 curriculum also needs to be tweaked in a way to encourage more communication and innovation as well as creative and critical thinking.

To combat these problems, we came up with the idea of a STEM Summer Camp for children of all ages and backgrounds in hopes to pick up the slack their schools may leave. With millions of unfilled STEM positions in the world coders, game developers, engineers, and designers are in demand like never before! At the STEM's of Knowledge 1st Annual Summer Camp, we will teach our students with hard skills for future careers and they will walk away with valuable 21st century skills problem-solving, critical thinking, and collaboration. Students ages 7-17 will be able to use their creative minds and bring their ideas to life with the help of our uniquely qualified and passionate staff. The students will be able to make that viral video, design a phone app, or develop that new hit video game. Our program features many innovative courses, blending world-class instruction with fun camp activities. During our summer week

long sessions, they'll explore an inspiring campus, make new friends, and build skills that last long after summer.

Literature Review

The STEM curriculum needs to be revamped in a way that all the subjects of STEM (science, technology, engineering, and mathematics) are integrated to increase proficiency amongst students. This will in turn encourage more critical thinking and innovation. According to research done by Pew Research Center, fewer than half of the public consider the STEM education in the U.S. to be at least above average in comparison to other developed nations. With the public already lackluster about the general education provided by K-12 public schools, statistics back they feel the same about STEM education. The acronym STEM stands for science, technology, engineering and mathematics taught in an way not only to increase proficiency levels in each of the subjects but in an integrated way to encourage critical and creative thinking as well as innovation and communication. Americans give somewhat better reviews to U.S. STEM education at the undergraduate and graduate levels. Fewer than half say that undergraduate STEM education (35%) or graduate education (38%) outrank other developed nations. People with postgraduate degrees whether in a STEM or non-STEM are more likely to give high marks to the quality of postsecondary education in the U.S. About 60% of those with a postgraduate degree in a STEM field say graduate education in STEM is at least above average, compared to those with some college or less which equates to about a third. In contrast, about half of those with a postgraduate degree in a STEM field see college-level STEM education as above average or better than competing nations. However, just 13% of those with a STEM postgraduate degree say K-12 STEM education is above average and about 51% say the

U.S. is below average in this instance. 27% of adults with little college or less education give K-12 STEM education in the U.S. the same rating. The public sees many problems in regards to K-12 STEM education. Americans contributed problems of K-12 STEM to uninvolved parents and disinterested students to outdated curriculum materials and an outsized focus on state standards. About 61% of U.S. adults say it is a big problem that parents are not involved in supporting schools. Similar shares say students' lack of work ethic (59%) and lack of interest in learning (57%) is a big problem for K-12 STEM education. In all, 55% of Americans see emphasis on prepping students for standardized state tests as a big problem, while about 53% fault teachers for not emphasizing the practical uses of these subjects. Roughly half of the public (49%) says a big problem for STEM education comes from teachers not using methods that help students think critically and problem solve, spending too little time on these subjects in elementary school (48%) or not having up-to-date curriculum materials (48%). Those who have a postgraduate degree in a STEM field tend to hold similar views about the problems facing K-12 STEM education. But, this group is especially likely to attribute flaws in such education to an underuse of teaching methods that promote critical thinking and problem solving (68% of those with a postgraduate-level STEM degree say this). When asked in an open-ended format which subject schools should emphasize more today, 28% of adults named a STEM subject. Specifically, 18% mentioned math or statistics, 9% mentioned science or engineering, and 3% mentioned computers or computer science. Other subjects mentioned include English (19%) and history or social studies (12%). Parents with children in public schools are modestly more likely than all U.S. adults to name a STEM subject as needing more emphasis (35% vs. 28%, respectively). People with a postgraduate degree in a STEM field are particularly likely to

volunteer that K-12 public schools should emphasize a STEM subject more than they do now – 42% say this, compared with 25% of those with some college or less education.

Teachers lack motivation in the STEM field. To bring about more number of students into STEM education, it is important to have qualified and motivated teachers in the classroom. Teachers should be encouraged to take career courses and refresher courses in order to keep their subject knowledge up to date. Quite often the teachers are overworked and burdened with extra-teaching duties so that is the reasoning behind their lack of motivation to inspire students in their STEM activities. Many high schools also do not offer advanced STEM courses such as chemistry, calculus and physics and science teachers are neither STEM majors or STEM certified. The U.S. doesn't have enough teachers to prepare students for our High-Tech economy. Ways to encourage more STEM majors to become stem teachers are by addressing the shortages of teachers at the local level, offer better incentives, and have organizations work together to bring awareness to the issue. Teacher prep programs should focus on teaching skills that are in demand locally so there isn't a overproduction of teachers in one area as opposed to the next.

A small percentage of students choose to pursue STEM degrees, and those who do generally have higher rates of major subject changes and drop-outs. In the future, there is going to be huge demand for skilled workers in STEM fields in America which the present level of K12 education may not be able to meet. With that being said, industry demand is far greater than the supply. This increase in demand for specialized skills in engineering, science and technology means that higher and technical education must be encouraged more among young people. Presently, a small percentage of American high school seniors possess mathematics

proficiency and plan to take up a STEM career. Even among those who enroll in a college to study for a major in the STEM subjects, just about half choose to work in the same field. In 2015, President Obama called upon colleges and universities to graduate 1 million students with STEM majors. Aside from putting policies in place to motivate students to acquire a degree in STEM, they should also be motivated to further their education in terms of research and doctoral work. Innovation is essential for any country to remain ahead of others and all this can be brought about by curious and creative minds.

One major shortcoming of STEM education is the demographic achievement gap. STEM workers are predominantly male, from higher socio-economic backgrounds, and are commonly either Caucasian or Asian. Women and minorities are under-represented in the STEM world, and this has significant consequences as our economy demands that more tech trained individuals assume leadership roles. According to the National Math and Science Initiative, only 12% of black students and 17% of Hispanic students completed Algebra 1 before college. In comparison, 28% of Asians did in 2009 underscores the problem. Also worth noting, women still have less than 25 percent of all US STEM jobs. Now the reasons women and minorities are underrepresented are various, but they should be considered seriously when thinking about how to make STEM education more inclusive. For women, the issue is less about discrimination and more about stereotype, interest, lifestyle, and gendered expectation driven. For minorities, it is more teacher quality, exposure, discrimination, and access driven. The reasons coincide, but getting to the root causes of these shortcomings can help us address this social justice issue more effectively.

There needs to be an integrated approach when it comes to STEM education and learning about STEM. Learning to teach well is different across content areas, grade levels, and localities. As I mentioned above, STEM teacher preparation programs don't focus on the development of teachers broad range of content knowledge. Many teacher prep programs don't encourage or recruit candidates to train in subject areas that are needed locally. This causes overproduction of teachers teaching certain subject areas and not others. With that, the same can be said when it comes to students learning in school. When it comes to STEM, it isn't really beneficial to learn all the subjects of STEM separately. There needs to be a more integrated approach meaning, the science, technology, engineering, and mathematics aspects need to be taught together in a sense. STEM education will continue to fail to meet their goals till they do so. This can be achieved by collaborating with government agencies, private organizations, and non-profits.

Innovation Relevance to Other Courses

The innovation we came up with relates to business, sociology, and Interdisciplinary courses I have taken. For example, since the innovation we came up with is a Summer Camp to teach kids about STEM we will have to have some type of business knowledge to run it affectively. There will be budgeting, planning, and collaborating amongst many different people and groups. In my sociology class I learned about ways to interact with people of different backgrounds, ages, etc. and with a summer camp of hundreds kids coming from all over the world, our staff will be knowledgeable on how to deal with the mixed demographic. We plan to have over 20+ innovative courses for people with different interests, backgrounds, and skill levels and they will be taught by our stellar staff. Interdisciplinary courses prepared

me for having knowledge across a wide range of subjects. That is what STEM is all about, bring multiple disciplines or subjects together to achieve something much greater.

Determine whether the Innovation is Effective

To determine whether or not the Summer Camp is effective we will have to look at the attendance numbers, how well the teaching is going, if the kids are learning correctly, and if they are enjoying themselves outside of the STEM learning. We want to show them there is more to life as well. We want the children to engage in the learning environment by building and redefining theories and models, collecting and analyzing data they find, constructive criticism of ideas and arguments, and using specialized ways of talking and writing to present their ideas.

How to Turn The Innovation into a Reality

In order to turn this Innovation into a Reality, there are many steps we will need to take. One of the first steps I would take is figuring out what courses we will offer during the duration of the camp. The courses I would like to feature are Coding, Video Game Development, Robotics, and Design. From there we can develop many different innovative courses tailored for students with different interests, backgrounds, and skills. I think one of the next steps would be budgeting. We will need to budget for food, housing, and other off-campus activities for the students staying. The summer camp will be overnight so we need to account for bedding and feeding the kids. We want to offer kids' stuff other than just learning about STEM so we plan on having off-campus activities such as board games, sports, tournaments, and excursions. It is important we see how much it will cost to make these courses work as well and what technology we need to do so. We want to make it innovative so we will need to invest in

the standard Industry Products from companies like Apple and Google. Once we have the curriculum and an idea of all the products we need and a budget for taking care of our students, I think we can then go to the bank with our business plan and get a loan for it all. Once we get our approved loan, next is will be hiring staff. We will look for unique and passionate staff members from top universities and tech companies. We will spend time training our staff so they are knowledgeable of what we want to do at the camp and ready by the first day. We will then have to find what universities will allow us to host our camp there and how much it will cost us to do so. We want to do the summer camp at a college because we want the students to go to college of course when they graduate high school but we want them to get an experience of the campus life beforehand because it will be very beneficial. These are the next steps to take to bring this innovation to life!

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