

# Meeting the computer training needs of Innovation High School students.

## How to satisfy the great demand for coding courses without breaking the budget.

Today's education leaders are facing many challenges when it comes to providing instruction in computer programming that is relevant and affordable. For many schools finding qualified educators and choosing the correct platform to teach often seems an impossible task.

Fortunately there is package available to Innovation High School that is affordable and easy to implement. Introduction to Coding (ITC) will provide students with current, exciting and marketable skills while teaching them the basics of computer coding.

### Why teach programming?

Computer science is a strong force for economic growth and is altering culture because it can be applied to a variety of industries. Computer science enables innovation in virtually every field that can be named. The United States Bureau of Labor Statistics estimates that job growth rates for computing professionals will grow by twenty one percent (BLS, 2012). These 800,000 new jobs are more than double the growth rate of any other occupation in the United States (computinginthecore.org, 2012). This field is especially attractive for students in Jersey City because individuals can be trained for success in many of these positions without a large investment in tuition.

Edward Lazowska who is the Bill & Melinda Gates Chair in Computer Science & Engineering at the University of Washington states that; "Information technology is applied in almost every profession and those who can bend the power of the computer to their will – will be positioned for greater success than those who can't". He goes on to say every 21<sup>st</sup> century citizen needs to have skills in "computational thinking" – problem analysis and decomposition (stepwise refinement), abstraction, algorithmic thinking, algorithmic expression, stepwise fault isolation (debugging), modeling (Lazowska, 2013).

We have heard many times about the high demand for individuals with computer programming skills before. However, the benefits for this class go even further than just career opportunities. For example, students learn how to customize control of a smart object to accomplish a task; be it a coffee maker, robot or iphone. Translating a set of instructions from English to the language of the environment in which the application will run. Students learn to organize data which is an important skill in fields from to accounting to zoology. One important factor is that the learning that takes place in this class is not taught in a vacuum. Students will define the task then code a solution. The practical skills developed in this class will not be lost when the student leaves the class.

### Why teach visual basic?

The use of visual basic excel has been chosen because it comes installed by default with the Microsoft Office so it costs nothing. This application will allow the coder to create a variety of business applications including but not limited to: scheduling, basic accounting, product sales, and customer data. Microsoft Office has ninety percent of the market share of personal computers around the world (smallbusiness.chron.com, 2014). These programming concepts are also easily transferred to other applications.

### The class

The structure of the class is based on a website that provides students with instruction on how visual basic is used in a business environment. They will be required to view tutorials that demonstrate programming concepts and applications. After each lesson students will code their own programs fulfilling specifications provided by the example. When a student has successfully completed the lesson their work will be electronically submitted allowing them to move on to the next level at their own pace. Each new assignment is slightly higher in complexity. The last lessons have no video and students need to follow the written specification to successfully complete the work. The interdisciplinary activities can be modified to any subject area.

The website's architecture is based on the research completed by Julie Dirksen. She defines five areas or as she calls them gaps. The gap refers to where students currently exist and where they will need to be in order to experience success (Dirksen, 2012). How the website addresses each of these gaps is listed below:

Knowledge – video lessons provide instruction on how students will navigate visual basic and organize their work.

Skills – students will be required to code their own projects after each lesson to demonstrate their competency.

Motivation – students will be motivated because they will experience success as they gradually increase their skill level through the program.

Environment – the video lessons clearly show learners how to become masters of coding in visual basic.

Communication – each lesson clearly explains what is expected in each of the projects thereby virtually eliminating the frustration that beginning coder's experience.

Introduction to Coding is the solution to Innovation High Schools computer programming instruction needs at no cost. This course provides students the opportunity to enter the world of computer programming with real world coding experience. It opens a bright future and fruitful career opportunities in whatever field they choose. Please visit the site at [http://scienceclassonline.com/njcu/njcu\\_innovation\\_hs.html](http://scienceclassonline.com/njcu/njcu_innovation_hs.html).

### References

Burns-Milyard, K. *How do businesses us excel?*. Chron. Retrieved from [smallbusiness.chron.com](http://smallbusiness.chron.com) on November 7, 2014

Dirksen, J. (2012). *Design for how people learn*. Berkeley, CA: New Riders

United States Department of Labor, Bureau of Labor Statistics (2014) *Occupational outlook handbook*. Retrieved November 1, 2014 from on <http://www.bls.gov/ooh/>

Lazowska, E & Roberts, E. *Tsunami or Sea Change? Responding to the Explosion of student interest in computer science*. NCWIT 10<sup>th</sup> Anniversary Summit, May 2014, CRA Conference at Snowbird, July 2014. Accessed on November 1, 2014 from <http://lazowska.cs.washington.edu/NCWit.pdf>