Preparing Students for a Career in Software Development and Digital Media

Preparation for Their Economic Future Now

Dr. Rod Sanchez

There is great economic and educational opportunity to implement software development and digital media training programs within schools in states like New Mexico that are in desperate need of economic development initiatives. Learning software development and digital media production techniques using a structured curriculum can lead to rewarding and lucrative careers for students – in fact, digital media is one of the fastest growing job sectors in the world today. Recently, US News and World Report found that software development was the number one job opportunity for 2014. Economic analysts predict that digital media will constitute a $300B industry by the end of 2015. At the same time, several leading technology companies are seeing a shortage of technically skilled digital media professionals in the US. The United States is in a strategic position to intercept many of these economic opportunities – if we adequately prepare a skilled talent pool that is versed in aspects of digital media production.

As evidence, below are some key data points from leading economic analysts around the world:

- 9 out of 10 of the top grossing films of 2014 were either full feature animation productions or feature films that were heavily dependent on computer generated imagery (CGI) – with combined production budgets of and a combined revenue of over $8B;

- Median income for multi-media artists and animators working in the motion picture industry is nearly $60K for those entering the profession and demand is expected to grow 8% per year for at least the next decade;
• Digital media based mobile software applications (‘mobile apps’) development and distribution is expected to reach a market capitalization of $100B by 2015; it is estimated that mobile device usage will overtake desktop Internet users by the end 2015;

• The use of ‘mobile apps’ is predicted to have a significant impact on the healthcare system: (1) improved access to care, (2) improved patient engagement, (3) new provider business models, (4) reduced Medicare fraud, and (5) improved patient safety;

• Demand for employees with software development skills for ‘mobile apps’ grew in 2012 by 240%, by 400% in 2013, and again by 400% in 2014;

• The worldwide gaming industry is expected to reach $111B in revenue by 2015; experts predict that digital media game development will be the fastest growing form of media in the next decade;

• Demand is growing for emerging media game developers; the number of university majors in game development has doubled in two years; the average pay for a video game developer is $71,354;

• ‘Serious Gaming’ is rapidly growing in the US and is being used for everything from training healthcare professionals to simulating nuclear disaster drills;

Digital Media Training Program

In 2013, Dr. Rod Sanchez began a collaboration with several schools in New Mexico to pilot a digital media training program for high school and university students. One of the key elements that make this program unique is that it involved input and participation from real-world companies and working digital media professionals in the industry. Major elements of the program include: (1) mobile software applications (‘Mobile Apps’) development, 2D/3D digital animation, and digital game production.

Students participating in the program have learned basic skills in various aspects of digital media production. Some student projects include the production of an iBook (electronic book that incorporates multi-media) to promote tourism in Santa Fe (NM), a mobile app and digital game for the Museum of Natural History and Science, a mobile app for UNM West, and the formation of an digital game production initiative where students developed an online digital game (sponsored by HP and Intel Corporations). Future projects include a mobile app for NASA’s Mars Rover team and the development of a ‘serious game’ to be used by nursing students as a supplement to their medical training.

Also, leading technology corporations have recognized the strategic importance of this program. As such, companies like Intel and HP have contributed cash and equipment to some of the schools involved in this initiative. Furthermore, individuals with experience at companies/institutions such as DreamWorks Animation, Pixar, Google, Microsoft, MIT, the University of California at Berkeley, HP, Intel and others are personally participating in this effort to lend their collective expertise and talent to
students. The observed importance of industry involvement in these experiments are two-fold: (1) students receive real-world advice, direction, and instruction from industry experts and (2) students begin to form career networks with representatives from potential future employers.

**ACADEMIC OBSERVATIONS**

CONTEXTUAL LEARNING – The academic theory examined is the notion that if abstract concepts (such as science, technology, engineering, and math - STEM) are presented to students in a context that is interesting, perhaps entertaining, and one that they can relate to their daily lives, they are better able to grasp these concepts. For example, it is observed that most students are immediately interested in 3D animation – however, in order to create realistic 3D digital animated images one must employ aspects of geometry, physics, math, and even advanced aspects of fluid dynamics. Whereas, some students traditionally had trouble relating these abstract academic subjects to ‘the real world’, now they are able to directly learn and apply them to a project that they are interested in. As contextual learning theory goes, if students see that learning STEM concepts are necessary to evolve their progress toward a project/initiative that they are excited/interested in (digital media production) they will be intrinsically motivated to learn and better able to retain this information because it is in direct relation to a project that is perceived by the student as ‘on the cutting edge’ and can lead to an exciting career pathway. To illustrate this point in student vernacular, it is often overheard in various forms -- students exclaiming: “Digital media ‘coders’ are the rock stars of the future”.

**FUNDEMENTALS OF ENTREPRENEURSHIP**

It is important to note that students involved in this digital media production program were working on real projects to be used for a practical purpose. For example, the mobile app being developed by students for the NM Museum of Natural History and Science is expected to be used daily by a large number of its 250,000 visitors annually – and thus, requires input/direction from the museum’s various curators, exhibit directors, and staff. The mobile app will become a critical element to the museum’s overall institutional strategy. As such, as part of the project, students develop business documents such as a scope of work, project timeline, and project budget. Furthermore, students think about how to market the product once developed and refine the product over time by using consumer feedback and other analytics.

As of March 2015, one group of students have sold their software product, two groups of students are in business negotiations for the sale/licensing of their products, eight students have gained employment and 3 students have earned internships in the digital media industry.

**Future Plans**

Identify a small group of schools in the US that are interested in participating in this digital media collaborative. The goal is to facilitate communication, interaction, and instruction amongst students and teachers involved in the digital media program. And, most importantly, this is an opportunity to give our students a powerful economic advantage as they enter higher education and seemingly any career they chose in the future job market.