PROPOSER

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STATEMENT OF TOPIC

STEM Careers Infographic Project (SCIP): Teaching Media-Based Computational Thinking Practices

SIGNIFICANCE AND RELEVANCE OF THE TOPIC

Infographics have permeated our culture as a leading form of information display and communication. They can be seen everywhere from business and news to social media websites. Infographics are also unique, since they combine beautiful visualization with an impactful way to deliver direct information. It has been demonstrated that infographics can be used to advise non-expert audiences so they can make informed decisions [2]. They have also been used as an extremely effective communication tool over traditional tools such as email and reports [4].

Despite the popularity of infographics in the public realm, there has been little research addressing the potency of infographics as a learning tool. Vanichvasin conducted a study with fourth-year university students, where infographics were used a visual communication tool in a Business class [5]. Results from the study showed that infographics have the potential to enhance appeal of the course, yield a positive impact, and enhance the quality of learning.

Krauss advocates the use of infographics in K-12 classrooms in her paper Infographics: More Than Words Can Say [3]. She lists five simple steps to follow when creating an infographic, and gives example projects where infographics can be used in the classroom.

Aside from these two articles, we have found very little research regarding using infographics in K-12 level as a learning tool. We aim to further the research listed here by showing that infographics can be leveraged as an advantageous communication and computational thinking tool at the middle school level.

We developed the curriculum of SCIP with the 6 Computational Thinking Practices (CTP) outlined by the College Board [1]. We used this outline to structure of the project because it encourages computing and computational thinking to other learning contexts outside of programming. SCIP was a media-based project, which aligned with the goals of CTP.

This project was also a very diverse group of students participating, many of whom wouldn't have been exposed to similar computing programs in school or at home. According to a demographic survey sent out at the beginning of this project, 53% of the students reported being Hispanic/Latino(a), 38% Caucasian, and 9% reported other ethnicities. Additionally, the school district we were working in reports that 48% of their students qualify for the national free or reduced lunch program. These students are just as curious about the computing and STEM fields, but are often not given the opportunity to explore their interests because of lack of resources or cultural circumstances. SCIP is an exploratory project that provides a framework to introduce these students to STEM careers while teaching them computing and computational skills that can be transferred to other educational areas.

[1] College Board 2013. *The College Board AP ® Computer Science Principles Draft Curriculum Framework August 2013*.

[2] Barboza, C. A. (2013). From Digits to Diagrams: Using Infographics to Inform Database Retention and Cancellation Decisions.

[3] Krauss, J. (2012). Infographics: More than Words Can Say. Learning & Leading with Technology, 5191(February), 10–14. Retrieved from http://eric.ed.gov/?id=EJ98286 Computational Thinking Practices (CTP) outlined by the College Board 31.

[4] Myers, K. L. (2013). Demonstrating Impact through Effective Communication. Library Publications and Presentations. Retrieved from http://digitalcommons.brockport.edu/drakepubs/12.

[5] Vanichvasin, P. (2013). Enhancing the Quality of Learning Through the Use of Infographics as Visual Communication Tool and Learning Tool. In IQCA ’13 (pp. 135–142). Ratchathewi, Bangkok. Retrieved from http://www.icqa2014.com/downloads/Proceeding_29.pdf#page=135

CONTENT

The poster will include a description of SCIP, intended learning outcomes, a description of the 4-week curriculum, outcomes of the project, and examples of student infographics. We will be highlighting how the curriculum design aligns with the 6 Computational Thinking Practices and showing how this structure enabled and encouraged our learning outcomes.

ABSTRACT

The STEM Career Infographic Project (SCIP) was a 4-week exploratory project deployed in an 8th grade classroom at Mountain Vista Middle School (MVMS). SCIP was poised to address the growing focus on STEM fields at MVMS and within the school district. We piloted SCIP in Spring 2014 with six science classes or about 180 students. SCIP allowed for students to explore their own STEM interests, while simultaneously engaging in the 6 Computational Thinking Practices (CTP) outlined by the College Board.

Students were required to research a STEM career in-depth, then report on their careers using infographics (CTP #2: Creating Computational Artifacts and CTP #3: Abstracting). We used free and online programs to create the infographics; this provided the students the opportunity to learn software they were not previously exposed to and to explore new communication tools (CTP #1: Connecting Computing and CTP #2: Analyzing Problems and Artifacts). SCIP also provided many occasions for the students to work together by sharing career information or helping each other with the software (CTP #6: Collaborating). At the end of the project the students presented their infographics in front of the class and taught their classmates about their career (CTP #5: Communicating).

The project was incredibly successful. The students had a positive affect through the duration of the project and many also expressed an extreme level of interest in doing similar projects in the future. We will be repeating this project in Spring 2015, with a few adaptations and formal evaluation scheme.