Flipping The Classroom to Teaching Computer Programing

9175 EDTC 813 Advanced Using Interg Software

New Jersey City University

Sunday, August 7 2016

Dowayne Davis

Description of Flipped Lesson

In 2008, Jonathan Bergmann and Aaron Sams stumbled onto an idea to use teacher-created videos and interactive lessons, to give students access to instruction at home, in advance of class time. Bergman and Sams' classroom became a place to work through problems, advance concepts, and engage in collaborative learning. (Tucker, 2012) Bergman and Sams' classroom became a documented version of what is now called, the flipped classroom model.

The goals of this flipped classroom lesson is to introduce and teach computer programming to a class of ninth grade students. Students will be given a lesson plan document that provides the topic to be covered, learning objectives, directions, and links to online content. Unlike traditional instruction in which students are introduced to a topic in the classroom, this flipped lesson will introduces new content outside of the classroom to prepare each students for work in the classroom. (Bergman & Sams, 2012) Work in the classroom include, discussions, projects, assessments, and re-teaching. *Appendix I* is a copy of the digital handouts that directs students' learning outside of the classroom and outlines the work to be carried out in the classroom.

The process of this flipped classroom lesson begins with new content reviewed at home, followed by discussions and/or exercises in the classroom, and concludes with exit assignments and/or assessments. The flipped lesson cycle will move forward with new lessons as students show adequately understanding of previous content and mastery of objectives. (Bergman & Sams, 2012) Daily assessments will serve as key data to evaluate student mastery of new content and support the teacher's decision to move the lesson forward or use future lessons and class-time to re-teach a concept or area.

Guidelines For Content and Lesson

To maintain an effective flipped classroom this lesson was designed using simplicity, short videos, authenticity, engagement, accessibility, and national standards, as guiding principles.

Flipping The Classroom to Teach Computer Programing

Simplicity: Simplicity is an important aspect of this flipped lesson because it ensures that students are only exposed to the topic being taught and are not distracted by unnecessary content. Simplicity also creates a learning environment that is less likely to create confusion. (Burkholz, 2012) This lesson achieved simplicity by only focusing on one topic – programming.

Short Videos: Each video used in this flipped lesson is less than fifteen minutes long. Shorter videos are used to be empathic to the attention span of students. Shorter videos promote engagement, as they are more likely to be viewed in full by students. (Bergman & Sams, 2012)

Authenticity: To promote student engagement authenticity was achieved by creating a video specifically for this lesson using the teacher's voice. Providing an authentic video that is created by the teacher promotes the ability for student to better connect to the media.

Engagement: Student engagement is a fundamental component to any learning environment. (Michael, 2006) With multiple short videos, animation in the teacher's voice, generating content on the screen, and simplicity, engagement was achieved in this flipped lesson.

Accessibility: Since students are required to view content at home, having access to the content is critical. Therefore, providing multiple options for access improves the effectiveness of a flipped classroom. Accessibility was achieved in this lesson, because all content is provided via the Internet. All content can be view using a computer, smartphone or a tablet. Furthermore, if a student does not have access to a computer or the Internet, the media can be burned to a DVD and shared with the student. (Bergman & Sams, 2012)

Learning Standards: Study suggests that, students who are generally proficient in the, standard such as the Common Core standards will likely be ready for a wide range of postsecondary courses. Therefore, alignment to national standards is important. (Conley, et al., 2011) Alignment to national standards was achieve by designing each objectives to align to either technology standards set by the International Society of Technology Standards or Common Core State Standards.

Appendix I – Flipped Classroom Digital Handout

Success Academy High School

Computer Literacy Section 101 - 9th Grade, Section 1

Sunday, August 7th 2015

Lesson 1: Basic Understanding of Computer Programming

Directions: To successfully navigate and understand the content of this lesson, watch each media in the specific order below. Do not skip a media.

Learning Objectives and Standards

Students will be able to:

- Use and understand various technology systems in KHAN academy - **ISTE: 6-B**

- Use computer applications effectively and appropriately - **ISTE: 6-B**

- Transfer current knowledge to learning of new technologies – **ISTE: 6-C**

- Apply existing knowledge to generate new ideas, products, or processes - **ISTE: 1-A**

- Use age appropriate drawing applications – **CCSS**: **EE, A, F, SP, SMP 5 W 8, SL 5**

- Using Web 2.0 tools to create simple programming language **CCSS**: **EE, A, F, SP, SMP 5 W 8, SL 5**

Task List

1. Lesson introduction. Click here.

2. What is programming? Click here.

Flipping The Classroom to Teach Computer Programing

3. Read how to learn programming in Khan Academy. Click [here.](here)

4. Study how to draw simple shapes using code. Click [here.](here)

5. Study how to draw figures using code. Click [here.](here)

6. Review discussion questions and prepare to contribute in class

Discussion to be Held in The Classroom

We will have a 20-minute discussion in class, using the following questions to guide the discussion.

1. What is computer programming?

2. How is programming similar to English or Spanish?

3. How is programming used in your daily life?

4. How have you used simple programing?

5. Why is programming difficult? Think about syntax.

6. How can we use computer program to solve daily problems?

Assessment to be Held in The Classroom

- Students will be given incorrect programming code study in Khan Academy and be required to identify and correct the errors.

- Students will be asked to use Khan Academy to re-create the figures using code.

Appendix II – In Class Assessment

Classroom Assessment I

Directions: Below you will find five pieces of code with one or more errors. Your task is to find the error in each code and rewrite the correct code.

Incorrect Code	Rewrite the Correct Code
ellips(100, 200, 300, 400);	
ellipse(30 145 60 90);	
ellipse(203, 200, 300, 300)	
ellipse50, 100, 50, 100;	
elli4se203 20x 300, 3y0	

Classroom Assessment II

Directions: Using Khan Academy's programming tool, write the code to recreate the shapes below. You may refer to the videos and tutorials shared in the previous lesson to help you. Once you have created the shapes, share your final product by sending the link to your work via email to ddavis@successacademy.org.
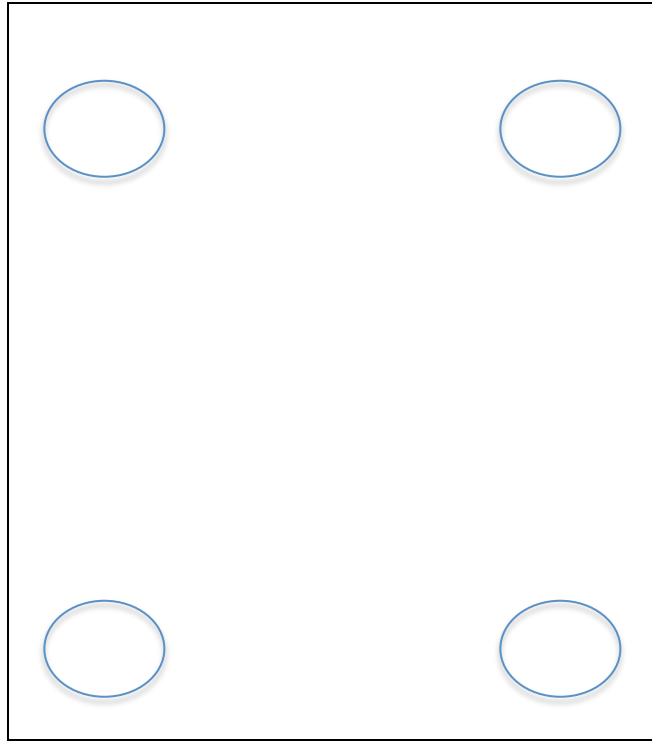
References

Bergmann, J., & Sams, A. (2012). *Flip your classroom: Reach every student in every class every day* International Society for Technology in Education.

Bergmann, J., & Sams, A. (2012). Flip your classroom: Reach every student in every class every day. *International Society for Technology in Education (ISTE), Kindle Edition.*

Burkholz, M. (2012). **The flipped classroom – simplicity** . Retrieved from https://flippedmind.com/2012/10/29/simplicity/

Conley, D. T., Drummond, K. V., de Gonzalez, A., Rooseboom, J., & Stout, O. (2011). Reaching the goal: The applicability and importance of the common core state standards to college and career readiness.*Educational Policy Improvement Center (NJ1),*

ISTE. (2016). ISTE standards for students. Retrieved from http://www.iste.org/standards/standards/standards-for-students

Michael, J. (2006). Where's the evidence that active learning works? *Advances in Physiology Education, 30*(4), 159-167. doi:30/4/159 [pii]

Tucker, B. (2012). The flipped classroom. *Education Next, 12*(1) Retrieved from http://search.proquest.com/openview/7047b268f4106b18fd41c52f2db40867/1?pq-origsite=gscholar&cbl=1766362