Clare Timblin
December 2015
ILT 6999

Learning to Code With a Pre-Reader

As a teacher of early elementary children and a parent of young children I was very interested in programs designed to teach coding to the very young. I had recently learned about two programs, a website called code.org and an app called Scratch Jr., that teach early coding language to children from four years to seven years old. Since my son, Peter, was a few weeks shy of turning five years old he made the perfect test subject to explore these programs. Peter is knowledgeable of letter names and sounds but is not a reader yet, thus a pre-reader. I was very curious to see how a coding program could teach a user without reading instructions and directions. This project gave me a chance to teach my son coding skills and to acquire more knowledge to use in the classroom.

I initially explored these programs on my own to make sure they were applicable and appropriate to use with Peter. The code. org website offered many coding games that would have interested him but were assigned to the six year old and above range. These games did require a limited amount of reading that I knew would frustrate a pre-reader. This site also offered courses under what is called the Code Studio. The first course, out of five, in Code Studio was created for early readers age four to six years old. There were eighteen stages to the entire course, some offline and most online. The stages started simple and became progressively more complex. I decided to begin using the code.org site with Peter before exploring the Scratch Jr. app, which seemed more game-like.

The first two stages were offline activities designed to have the learner create simple sets of instructions or algorithms for characters to move through a maze. The third stage mainly taught the learner how to drag and drop. Since I use a wireless mouse with my laptop I assumed that I could easily teach Peter how to use the mouse. Unfortunately, this took quite a bit of time and we ended up using both the mouse and the touchscreen. The next few stages directed the user to create algorithms using directional blocks marked with arrows to move characters in various directions for different reasons. Peter loved creating the sets of instructions, could count the correct number of spaces to move the characters and could predict what was needed to happen in advance. The activities also asked to find the mistakes in algorithms (debugging) which he was also able to do. Some of the following stages asked the learner to collect items in the algorithm to use later, create algorithms with lines in order to create pictures, and use repeating symbols to make actions loop. The cumulative stage involved creating a new story or game with the skills previously learned. Overall, we spent five hours on the course but did not complete every activity at every stage because of attention span limitations.

Scratch Jr, an app created for five to seven year olds taught an introductory programming language and was available in the iTunes and Google Play store. Much like the activities in code.org the learner used directional blocks to guide the characters to move, talk, sing, etc. Unlike code.org, Scratch Jr. gave users the options of different settings, a variety of characters (which can change color), the option to record sound, and the ability to upload pictures. The learner can create games or stories that can be sent through email or uploaded to a cloud service. It was extremely user friendly and completely appropriate for pre-readers. Initially we spent about an hour and half over the course of a week with Scratch Jr where Peter created three

stories. I did need to discuss story elements with Peter, such as sequencing and character consistency, in order for the stories to make sense.

The first obstacle and concern I faced was whether I was going to push Peter to use the mouse. He quickly got frustrated when using it and I pondered if it was a skill that was necessary. My laptop does have a touchscreen, as does the other devices he uses, so I wasn't quite sure it was something he needed to learn for the future. I ended up having him try to use the mouse each time and then use the touchscreen when he was ready. The second obstacle I encountered was Peter's limited attention span. Each stage had anywhere from six to fifteen activities. Each activity took three to five minutes. After a couple stages Peter lost patience when things did not go the way he wanted and I saw that he was getting tired. This made me examine how much time I wanted to do these activities at a sitting. He seemed to be able to engage the best before 30 minutes of time. Lastly, when using Scratch Jr. Peter waffled between making a sequenced story and playing around with the features of the app. I then considered how serious I wanted him to be when using this app. I knew that playing around could also lead to learning but could also be distracting, but allowed for some of both.

Code.org was an excellent introduction to early programming language and taught skills that were used with the Scratch Jr. app. Peter learned the fundamentals of using a coding language through the slow steps of each stage in the the first course of the website. Scratch Jr. allowed Peter to learn coding skills in a meaningful and authentic way by creating stories. He was very engaged with both programs but because Scratch Jr. was more creative he has since asked to use the app again. I did like that Scratch Jr. led me to teach Peter about story elements and I see how this could lead to deeper teaching of the subject in a classroom setting.

In the future I will use code.org's other courses with Peter when he reaches the appropriate age and skill level. The learning games on the site will also become accessible as soon as he can read. The original app Scratch, which is recommended for children starting at eight years old, could also be a useful tool down the line. For the classroom I have come to the conclusion that if I were to teach computer skills I would mainly use code.org. I would use Scratch Jr. in the classroom when wanting to teach computer skills with teaching language arts and storytelling. Lucky for parents and educators such wonderful resources for early coding exist.