Goal statement: My personal project is to teach kids how to code a robot using the coding language scratch 2.0 on an mBlock designed by me.

Personal Project Report 2017

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Investigating

Goal

The topic that I selected to complete for my personal project was to teach kids how to code a robot. I wanted to make it fun and interesting for the kids to intrigue people about coding and robotics. I decided to further my skill and knowledge in computers and coding and also make it easier for kids to do that and show them how easy it is. I wanted to break the stigma of what coding really is and that it is not what it seems from films that they watch. This goal has allowed me to learn a and practice how to code a robot and testing my knowledge by then teaching it to kids. Teaching the kids would test if my knowledge of coding is good enough to teach them. I could test if they understood if they can also then teach it back to me this will show me that I explained it to them thoroughly and efficiently.

This project is based on a personal interest because I am very interested in robotics and when I finish school I would like to go into the industry of IT. This project only focuses on a simple language that codes a robot. It is I think very good for a beginner level. I am also interested in this because hopefully I can elaborate further in it in the future to create apps and games. As a technology is evolving this skill will be needed to code all the new robotic inventions that are coming out. Also, that it will only keep getting easier to code and learn how to code.

In order to come up with my goal idea I had created a brain storm as seen in Appendix 1. I first began by listing my main hobbies around the circle. Then elaborated around by putting possible projects that can be done. I then connected one of the hobbies that can go with another hobby and then came up with my idea. Subsequently I formerly wrote out what my goal is and what I want to achieve in my project.

Global Context

My chosen global context for my goal is Scientific and technical innovation. Developing a teaching curriculum for coding and robotics is a way that I have helped initiate and advance my immediate community with technical innovation. Teaching kids about coding and robotics from my school will not leave them in the gloom when the world evolves into better technology that will require coding skills in all fields. Within the global context scientific and technical innovation, I focused upon how humans adapt to their environment and the impact of scientific and technological advances on communities as seen in appendix 2. I provided them with projects that required thinking to see if they can adapt and creatively think and come up with the solution. As well as, introducing new technology to my immediate community and teaching them about the advancement of technology as seen in appendix 5 my teaching plan.

Criteria

I created my marking criteria in order that I can measure my level of success of my project against it. The criteria are made up of four specifications, to test the knowledge of the kids by seeing, if they are confident in teaching it back to me. The next specification is to see and test if they are able command the robots and complete everything that I give to them. The third specification that I have made is if they are able to teach it back to me and another person. If someone truly understands a topic then they would be able to explain it to someone else, also to explain something to someone will also mean you perfectly understand it. The fourth and final specification that I will assess if the kid is able to improvise and make new code by himself with everything that I have taught him. The levels of success consist of the following 0 being the person having no knowledge, then followed by 1-2 as limited, 3-4 adequate 5-6 substantial, 7-8 being excellent in the table of my success criteria can be seen in appendix 3.

Prior Knowledge and subject specific knowledge

After completing my goal and global context prior to beginning my research for my topic I listed my prior knowledge of my topic this can be seen in appendix 4. I communicated all the knowledge that I don't have that would be necessary. I listed all the necessary topics that I would need to research in order to research and teach to the kids. As the topic that I had chosen, which was teaching how to code a robot, is a hobby of mine, I had a fair idea of what was required and what needed to be learnt prior to embarking on this project. I needed to know how to code and what was the best resource to teach code on. This was my biggest part in my personal project. In addition to this I had to know the theory behind code and how it works to explain to the person I was meant to teach it to. In completing this part, I knew exactly what I know and exactly what I needed to know.

Utilising the information above and from appendix 4 I went out and began gathering websites from many sources online. I began my research about the STEMS crisis in Australia and researching about the level and the availability of IST classes in Australia and in my own school. This will help in developing my classes and to what intensity upon which the classes should be based upon. I also researched which different languages are the best to teach and what will be effective and easy. After that I had researched what would be the best robot, I did not have to do heavy research because my supervisor lead me to a course for exactly what I am planning on doing. I attended one class and gathered the robot and language they teach on and it turned out to be perfect. So, I did further research into it and the robots required and began planning.

Planning

Planning Process and Development Process

In the planning phase of the personal project three major steps were completed. I completed my success criteria as mentioned above. This was for me to assess my product once I had finished and seen how well I had taught and explained it to the student. This is then followed by the action plan. The action plan as seen in appendix 7 was made for time management skills and in order to know exactly when everything should be done. This kept everything in order and allowed me to be organised as one of my ATLs requires me to create long term goals and short-term goals. Afterwards, I had gathered my resources in preparation for my research.

Primary sources:

In my personal project I only acquired one primary source as that was all that was required of me. My primary source that I used was a class that I attended to on the 25th of May. The coding robotics class was conducted by Hieke Orhrmann funded by the bayside council at Rockdale library. The class was for free which worked out really well. In this class it was an introductory class and the teacher covered all the parts of the robot and all the on-board functions. I ran into a problem and the teacher could not troubleshoot so there was not much for me to do. This class was informative in its own way.

Secondary resources:

There was a large variety of secondary sources available online for the research that I was conducting. I used various websites about different languages and statistical data of coding in schools. I verified the information I was getting by visiting various websites and testing them to each other. Each coding language that I researched about I used two websites for each to get proper information. When I was acquiring statistical data, I visited various sites to make sure that the information was a reliable source. All of my secondary sources were acquired from the internet as this provides sufficient information for what I need to cover.

Taking Action

Key Critical decisions (explained and justified) and Final Product

There were many key critical decisions that I had to face throughout my personal project form whether I should procrastinate to deciding what would be the best choice to make my product come out the most effective. In order to make the most effective product I had to plan out my lessons. As seen in appendix 6 I had to decide when I should teach specific knowledge and when would it be best to leave it to another lesson.

In lesson 1 I had decided to keep it theory based and introduce what they will be learning and what type of robot they will be learning on, then it was followed by another introductory lesson of the program and everything that you can do on it. I planned to squish every two lessons together since they were always related. For lesson three as we were staring practical work I had to decide what would the best first lesson be. I

decided on it being a lesson on the function of the lights and how to make it blink and various other things. Deciding on spot I also threw in a project for the student to complete. Afterwards for each lesson I made a project for the child to complete once the lesson had finished. In lesson four the same functions but for the buzzer were included and they were also taught how to mix the light lesson and the buzzer lesson. Lesson five consisted of how to use the sensors and lesson six was a free roaming class for the student. Finally lesson 7 was a test, the student was to choose from two projects and using the knowledge taught to them they were to complete it.

Another key decision was the design and what my robot will contain. I decided that I will buy the parts of the robot that will allow me to construct two robots for the price of one. I had to construct the robot myself with my own design and resources as seen in appendix 9. This part took almost a term with the delivery of the robotic parts which I couldn't construct myself and the time to actually build the robot.

My final product took a turn of events, I taught class mates during the IST class how to code. Due to short timing we did not have enough time to finish the complete program. During the two-week holiday of term three I taught my little sister who is in year 1 and her age is 7 years old. I taught her the first three lessons of the programming curriculum that I had created. Surprisingly, she comprehended everything and taught it back to me and other family members. She also could create her own code independently. She made the light flash and even accessed the lights connected to the board and made each one flash by itself. Given I had better time management skills which began to lack in the third term for teaching I believe this could be taught to anyone.

Reflecting

Evaluation of project

My personal project was a rather successful project. I created a goal and worked towards it by making goals and deadlines with my super visor. Through hard effort and good time management which laxed at some points I was able to reach my goal and create my product. My product was rather effective and worked out efficiently as I taught it to the kids. Due to my time management-skills laxing near the end of the personal project thus teaching my class mates during the IST class as planned with my supervisor did not work out well. I got only two classes to teach my class mates thus testing and creating my product with them as explained in appendix 5. So, I quickly problem solved and decided to do it during the holiday with my little sister. We did not get to complete all the lessons but her level of comprehension of the lessons was uncanny and she ended up being able to code independently making the colours of the board change and making every single led independent in doing so.

Reflecting on you IB learner profile and your chosen Global context

Through completing my personal project my knowledge and understanding of the global context has widened. Through researching about my Australian community and the school of Australia I am able to understand the importance placed on the studying of robotics and its availability. The scientific and technical innovation guiding question is how do Australian school interact and adapt with their technological environment? Through the research of Australian schools and their interaction with technology, as well as the number of graduates that graduate from a coding degree or in that field I have realised how little Australia has advanced in the technology side of education.

The IB learner profile I believe this personal project lead me to cover and explore was the risk taker learner profile. I took a major risk in tackling a project I had almost no clue about and not only learning it, but also teaching to others. Then getting them to teach it and explain everything they learnt to one other. I had thrown myself in the dark and climbed out through taking risks and taking additional classes.

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