

Get in the Game: Using Minecraft: Education Edition to Increase  
Student Interest in Engineering and Technology

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## **Get in the Game: Using Minecraft: Education Edition to Increase Student Interest in Engineering and Technology**

I chose to use Minecraft: Education Edition (M:EE) for my capstone project to help increase interest in Engineering and Technology. There is a wide variety of worlds that have been developed to use on the Minecraft Education website. I chose specific lessons that aligned with my state-based standards that I teach for my class.

The choice to use Minecraft Education was made because our county has it set up to where teachers can use it effectively in their classroom. The county also encourages it, the students enjoy it, and research shows that game-based learning increases the engagement level of students (Toscano et al., 2015). I have used it for all grade levels in the past, and most of my students are already familiar with the application. There have even been numerous times that students have taught me how to do things in Minecraft when I was struggling learning to use it myself.

### **Description of Capstone Experience**

The idea behind my Capstone Project was to leverage pre-existing knowledge and game-based learning to generate interest in my class and incorporate the state-based standards that I use for my curriculum. The M:EE website has a great community and worlds that these contributors made to reinforce ideas, as well as use an authentic way for students to learn the standards. There is also research that backs the benefits of social-emotional learning that M:EE provides (O'Sullivan et al., 2017). I could not agree more, and I feel the SEL angle might even be the stronger benefit of using M:EE in the classroom. Students of all cognitive levels are excited and familiar with the game, and the collaborative aspects of the

game are amazing. I thoroughly went through the website and identified lessons that were uploaded by contributors that aligned well with my curriculum.

### **Implementation**

All in all, the experience was positive; however, I also experimented with more detailed lessons created by the Minecraft team to help computer science (CS) teachers implement CS into their curriculum and these lessons did go better. There is nothing that can replace detail and experience when implementing your lesson plans. The initial lessons that I selected could certainly get to a higher level through trial and error, adjustments to the lessons, generating additional resources, and even the modifying the game world itself, but having a team work on the lessons and worlds certainly provided a better experience. As a technology teacher, I value highly detailed, scripted lesson plans, because any gaps that the lesson itself had was amplified by having to troubleshoot day to day issues that arise. Being the only teacher in the room, I noticed the CS lessons went much smoother. The lessons I chose initially are rough sketches but still need a good deal of work to be ready to be a true success.

### **Project Outcomes**

I also shifted my original plans regarding some of my deliverables. I used the numerous CS units created by the Microsoft team, and for each unit they have survey questions included. They are open ended questions, but I like this because the students are more than happy to provide their opinions. I used Microsoft forms because we are a Microsoft school, and they generate word clouds with words and phrases that show up most often. I am pleased that I see students getting excited when we do this. It makes me feel good that many of our students are excited to learn things. This is exactly why I chose

to use M:EE. They also generally have insightful responses. One question asked to them is why learning computer science is important, and one of the most popular combination of words was future and jobs. I am glad to see that they see value in the standards I am teaching them, even though this is middle school. Regardless, I need to work on these formative assessments much more, but it was a good start, and it did provide insight. I have taken Data Analysis since writing my Capstone and much of what I learned in that course will help me refine my data. Forms exports Excel files, so overall, the process will be painless. Tad for the outcomes of the original lessons I started with, some have been better than others, and some short compared to the ones created by Microsoft for CS. The Coding in Minecraft created for CS has student workbooks, lesson plans, and presentation with objectives and learning targets included for each lesson. I strongly believe lessons and resources crowdsourced from collaborators specifically for educators make a distinct difference. I also have a exemplar to use to create my own deliverables for some of the rawer lesson plans that are included on the website.

### **Barriers Encountered**

Fortunately, I did not come across too many barriers. I mentioned above some of the barriers that I discovered in my original capstone lesson choices. As for technology and the problems that come up on that front, everything worked great. That is a main reason why I chose M:EE. Our county does a great job helping us implement technology into the classroom, so running Minecraft was not an issue. Other barriers to note were time management and managing expected outcomes. Some of my original lesson ideas can take a long time to implement. Another barrier is not being as prepared as you need to be. As the teacher, you need to understand how to answer the students' questions effectively, and

that information can only be gained by experience. Once the students are working on their own, there will inevitably be questions. Expectations and procedures need to be in place from the beginning, and you must constantly walk around to ensure students are on-task.

### **Follow-Up**

I plan to continue to use M:EE with my sixth graders as the year progresses. I am also going to continue to develop resources and fine tune the lessons. My initial implementation went amazingly well. I am thinking I will expand my lessons in the future using the CS lessons, but I am still going to build on the initial lessons. Once I feel more confident with the lessons as a whole, I will use them more often with my seventh and eighth grade students. In addition, the initial lessons need more resources. My plan is to start smaller and develop as time goes on. My only concern is how long Minecraft will be relevant. However, I am already amazed at how long it has been popular. They are constantly updating the game, which is great to see. Consistently refreshing the game should make it relative for a longer period and keep the interest of my students as they come through my classroom.

### **Discussion and Reflection**

I feel that the leadership angle didn't go as well as I would have liked it to. And I'm not sure how to remedy that. One idea I have is to do more social media promotion. In the meantime, I am going to continue to help others who express a need and continue to advocate for M:EE and game-based learning. I believe it holds a lot of promise and am excited to see how this area will grow in the future.

The best way to know how to do something and be able to assist others is to do it yourself and learn by experience. Experience in technology is something I fortunately have

a lot of. I have been involved in information technology since its early days, and this certainly adds confidence to my teaching. Using authentic resources like M:EE helps make facilitation easier. I am also a believer in working smarter not harder. Using these lessons gives me experience of what works and what doesn't, what can be improved on, and what I may be able to gloss over. This is something a veteran teacher does anyway but having deliverable/resources is critical for a technology lesson to work.

Students also gain more confidence in using technology the more they use it and the more it becomes a part of their culture. What they are learning in class is actually useful and can be applied in the workforce, and I do not doubt that these skills will help them in the near future. One PSC Standard that I felt help expand my knowledge and skills during my capstone project is Standard 3.6: Selecting and Evaluating Digital Tools and Resources. I spent a lot of time to researching M:EE before choosing to use it in my teaching. I needed to make sure that it would be beneficial to my students' learning and that they would enjoy and take away from it. To do this, I tested out, read about, and evaluated the program and even tried a few breakaway lessons with my students before creating a unit implementing it. I learned the importance of making sure that the resources I choose to teach with in my classroom are the right fit for my students and will help them meet the standards required by my district and state.

Another PSC Standard that helped me grow is Standard 2.3 Authentic Learning. Since beginning this degree, whenever I teach my students how to use new digital tools and resources, I have been making sure I am taking the time to model the resource in various ways to make it relevant to my students' learning. By using teaching tools such as instructional videos, interactive PowerPoints with directions, and PBL groups, my students

are provided with many different resources to make their learning authentic and closely related to useful skills and topics that are relevant to the real world. The more the students can relate what we are learning in my classroom to how it will benefit them in the real world, the more engaged they are and the more they can see using these skills in the future. I have learned a lot in my classes that have helped me make my lessons more authentic for my students and have become a better teacher because of this.

In conclusion, with all the praise I give M:EE, I know there are no magic bullets. Yet I admit I have fallen prey to all the charm that M:EE offers. Even though M:EE and game-based learning is new and exciting unless it is implemented correctly it does not equate to success. I still have plenty of fine tuning to improve the lessons and will continue to do so.

### **Recommendations**

I would certainly recommend to anyone interested in implementing Minecraft Education Edition to do so if their system and technology department can ensure it will work. M:EE is a great resource with a great community that is only starting. Again, anyone implementing M:EE should make sure that there are procedures and expectations that are clearly stated. I would also suggest starting small and working up to larger lessons. I am not referring to the size of the game world, but the scope of the lesson itself. The open-ended nature of Minecraft means that many lessons could last for days or weeks, but in my experience, after a day or two, engagement begin to wane. Be thorough and prepared and this can be an amazing learning tool in a technology classroom.

## References

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