Technology-Enabled Learning at MIT: The Students' Perspective

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Good morning everyone. Thank you for having me here for the LINC Conference. It's a pleasure to speak. I'm Cody Coleman, a graduate student in the Electrical Engineering and Computer Science Department. I'm currently pursuing a master's degree, a Masters of Engineering.

Today, I want to tell you about two turning points in my journey through academia. The first, to set the stage, is about where my passion and motivation for education comes from, which I hope will shed some light on what's really at stake when we talk about education. Despite the countless, sleepless hours I've spent in lab or studying for an exam, I realize that a lot of what determines success in education has nothing to do with the classroom at all. Then, with that in mind, you'll be able to better understand my work so far as well as my vision for the future of education. I'll secondly dive into my work at MITx.

So simply put, education saved my life. I started out at the bottom of society, but through hard work and determination, I was able to make it to the top. When I was born, my mom was in prison. My father left before I was born and to this day probably doesn't even know if I exist. With both my parents incapable of fulfilling their job as the guardians for me and my siblings, my grandparents thankfully stepped in and tried to adopt all of us.

However, despite their kindness, life wasn't easy. My grandparents were very old and they didn't know how to guide us, nor had the energy to. Eventually my mom came back into the picture, but she was filled with bitterness from her experiences and didn't really care about our well-being. To make matters worse, we were poor. The only sources of income that we had were the money that my mom got from governmental assistance and the social security checks that my grandmother got, which was just enough to cover the taxes on our house. So we struggled. We struggled to get food on the table, clothes on our back, and a roof over our head. It didn't seem like any of us were on the track to success.

Fortunately, education opened my eyes and made me realize that the life that I dreamed of could actually become a reality. Of course, this didn't happen overnight. This enlightenment didn't happen overnight. At first when I went to school, there was only two reasons why I went to school. First, it was an escape for me from all the issues that I faced at home. It was a way for me to get away, and instead of being bombarded by fights

and all the issues that we had, I was bombarded by knowledge. Secondly, it was a free meal, and even though it wasn't great, bad food is better than no food at all.

Moreover, I didn't really excel in school. I actually started out in remedial English classes and my math scores were actually average at best. The school that I went to was a poor performing public high school in New Jersey. We were 79 points below the state average on the SAT for the math section, 62 points below the state average on the verbal, and 71 points below the state average on the essay. The ratio of students to computers was 19-to-1, over 6 times the state average, which makes it very tough for an aspiring computer scientist.

However, none of that really mattered to me, because I had an indomitable motivation. I didn't want to live the life of hardship that my family did. This drive was my first turning point. This drive manifested itself in two characteristics, endless positivity and naive optimism. I turned the negative things that were going on around me into fuel for my journey, and I never counted myself out. I went after every opportunity regardless of how small of a chance I had and, so far, it seems like that's worked out. I'm here today as a recent graduate from MIT that graduated at the top of his class with a 4.9 GPA.

I've worked at Google for the past two summers, and I've been able to travel the world to China, Mexico, England, Switzerland, and soon India through numerous programs here at MIT. Yet my story doesn't end here. This is only the beginning. It is my turn to give back. Education, as I said, saved my life. It's akin to an accelerator, which instead of helping start-ups to grow opened up my life to a world of possibilities. Now I want to take that one step further, and I want to open up that same transformational process to as many people as possible. MITx is the perfect place for me to do that. It combines my love for computer science in such a way that I can benefit education.

So this brings me to my second turning point. Being able to work here at MITx has been kind of a gift. It's been the perfect combination, the perfect job, for me to achieve my ultimate goals. So for my master's, my main project is about rethinking the way that we interact with video. We're analyzing video in order to pull out insights for instructors to give them insights as far as how to make their lectures better, as well as developing novel ways of interacting with video in order to increase user engagement. My work so far has been focused on the latter part of that, but as I progress, I hope to get more involved in the analysis of video data.

Currently, I have been developing video clipping tools for the edX platform which will allow students to embed video clips directly into open-ended responses. This is done through a simple interface where a modal window pops up allowing students to jump to the specific segment in the video and capture the start and end times of that video. Then when they're completed with that, it embeds a thumbnail into the question, which is then seamlessly passed through the system for staff, peer, and self-grading.

Now, this project is a humble beginning of many more advancements in education tools and research. This tool that I've developed has sparked interest from Stanford, Harvard, and MIT to create an integrated annotation system in the edX platform for text, image and video annotations. This system will not only set the groundwork for many new problem types and assessments, but it will also give students their own digital notebook.

Student annotations on a course could be aggregated together to serve as personalized study material or a long-lasting reference to refer to for the rest of the student's life. From a research perspective, these annotations essentially are open sourcing the process of identifying highlights in a course to the students. These highlights identify key takeaways for the course, or best practices in increasing user engagement, as well as serve as an overview for the course to potential students. All of which both from a student and educator's perspective, are priceless insights.

To end, I want to tie everything together with a word of warning. As educators and people passionate about education, we all appreciate and understand the value of good teaching and the impact that education can have on one's life. I'm sure there are plenty of people in this audience that have also had similar life-changing experiences to that of my own. However, it's key to remember that these recent improvements in technology and teaching, such as my video clipping tool, are only part of the battle in education. In order to advance education, we need to M. I. T. – to motivate, to inspire, and to teach. Because even if we build the best tools to learn and teach, it doesn't matter if we don't make people want to learn. People can and have learned a great deal without technology, but undoubtedly technology does make it easier to learn. But if we don't stimulate interest and inspire people to continue when the work gets hard, it doesn't matter how easy we make it to access the material or how seamless the technology is integrated into education.

When I think back on my fellow students in high school and what separated me – why I was the one to go to MIT, why I was the first one from my high school to be here and to graduate from this institution – I realized it wasn't money. I didn't have any of it. My family didn't have any of it. It wasn't inherent skill. I started out at the very bottom. I wasn't smart. I'm still not smart, I just work hard. It wasn't access to technology. We didn't have internet at my house. We didn't have a computer. I didn't have a cell phone. I didn't have any of these fancy gadgets that people grow up with today. I actually had to go to the library in order to use the computer or take one of the few computer science classes that we had at my university in order to get access to things, and even then, we had firewalls blocking you from half of the sites out on the web.

Really what separated me and what made the difference for me and enabled me to achieve what I have so far is the fact that I have this drive, this motivation. What I want to do is to inspire others and to give other students that motivation, because that's half of the battle. If we don't get people to want to learn, it doesn't matter how great our tools are. So in short, I want everyone to walk away today motivated by the technologies we've all

seen, inspired by the shared successes we've had, and ready to teach others about the importance of education and what we need in order to make the world take advantage. Thank you.