Commencement Address Dr. Marcia McNutt

Boston University May 19, 2019

TRANSCRIPT:

2019 graduates, proud parents, family, and guests, distinguished faculty and members of the podium part, tt is my honor to be your Commencement speaker.

I'm especially humbled when I hear of the accomplishments of my fellow honorees receiving honorary degrees today. It is an amazing group of people and I'm so thrilled to be joining the ranks of those who call Boston University, their university.

Please join me in a round of applause for the graduates!

[APPLAUSE]

All of you are so fortunate to be earning your degrees from such a prestigious university.

Boston University was founded in 1839, which makes this its 180th anniversary. By US standards that makes BU old, historic and distinguished.

Universities are among the longest continuously operating institutions in all of human history. The University of Bologna was founded in Italy in 1088, making it 931 years old. Oxford was founded just a few years later.

So, what explains the enduring nature of universities? I don't think it's necessarily because they are innately nimble to keep up with the times. I mean, look at all of us on the podium, and in fact, you graduates parading about in costumes straight out of the Middle Ages! Rather, I suspect that for 1,000 years, humankind has valued the sort of critical thinking that is sparked and nurtured by a university education. This sort of preparation has never gone out of style.

In fact Adia Turner (*student speaker*) has already told you about how you've all grown in your confidence here. Adia and I spent a lot of time talking about our presentations today, and we totally are on the same page about that.

Now, it's possible, and I ask you to talk to your parents for confirmation – that one day you won't remember some of the material you learned during your time here at BU. That day could come as soon as tomorrow, depending on how hard you party tonight!

[CHEERING AND APPLAUSE]

But graduates, from today on, your life will forever be divided into two periods. There is B.C. and A.D., where B.C is before college and A.D. is after your degree. And during the B.C. period, most important decisions were made for you by your parents, and after degree, you're on your own. Okay?

And your education here has given you the ability to make those decisions for yourself. Now, compared to our medieval ancestors, the ones who came up with these lovely costumes, in many ways life is easier today. But in other ways, it is more confusing.

We are facing a perplexing array of complex decisions that affect personal health, safety, wellbeing, but also the future viability of our planetary life-support systems such as clean air, fresh water, biodiversity, rich topsoil, and a comfortable climate. We have more information at our fingertips than ever before, but, in today's world, even misinformation and disinformation, it's all being weaponized to obscure the truth. So how are you going to easily distinguish what and who to trust so that you'll make good decisions?

Now, what I'll argue today is that scientists have established rules for systematically deciding what to trust, and that those rules have served society and science well, for many years.

The basis of trust in science is transparency, control of bias, and the ability to independently verify results. These rules are simply expressed as: describe your methods, show your data, declare any relationships that might be perceived to have biased your views, consider what other hypotheses could possibly explain your results -- so consider alternatives -- and then finally, subject your findings to criticism from an independent verification by others.

While I've described these rules as the methods of science, they don't just apply to science. This set of procedures for deciding what to trust can be applied broadly to proposals or findings based on evidence from many sources: socioeconomics, marketing, social networks, communications, commerce, transportation, or any other areas of human decision-making where evidence and data are paramount.

So let's try this out.

Let's suppose my hypotheses is that only 1 in 10 of you graduates will remember in one week's time anything of substance from this commencement address. All right.

Now, let's suppose I gather some data and I find the startling result that half of you remember that the commencement address was about who and what to trust. Should you believe it?

Well, the first thing you should do is ask: what method was used to survey all of you graduates in order to come up with that 50% number?

Suppose I answer that my method was to send out an e-mail to all of you a week later with the subject line: respond with information on the content of the commencement address. That should be your first warning that my survey was flawed. Most of you students would probably look at that e-mail and say, "what commencement address?" delete, delete, delete.

So only a few of you who even recall that there was a commencement speaker, would even open the e-mail. So the survey will get a very biased result from the few of you that say, "Oh yeah, someone spoke to us," and those few that then open it, some proportion of them will remember the topic. Those who forgot the speech won't even respond. So this is clearly a result that you should not trust.

A better way to collect this data would be for me to randomly call the students and ask them about the commencement speech, but of course that would be a lot more work. So to get trustworthy results requires a lot of extra work.

Remember that.

Now let's take a more pertinent example.

Who should you trust when you go to vote at the polls? A candidate whose platform sounds good because it promises prosperity for everyone? But suppose that candidate is secretive about his or her own business dealings? Look at that? Or fuzzy about campaigning financing? Or has flip-flopped in the past on issues of importance? Or do you support a candidate whose platform might not be quite so rosy, but here she is transparent, about his or her own finances, discloses who has contributed to his or her campaign, and who has consistently worked for policies in the public interest.

I personally would not trust someone who has the potential to be biased by special interests, who doesn't disclose personal finances, and therefore, may not be working in the public interest.

Now, year after year, opinion polls consistently show that the public rates scientists among the most are trusted profession, and what a surprise, politicians among the least. Perhaps if we chose our politicians, using the criteria of trust used by scientists to screen their findings, we would have a more favorable outcome with our elected leaders.

Now let me give you a real world example of using the rules of science to solve the differences of opinion to get to a place of trust.

Now President Brown already told you about my work on the Deepwater Horizon spill. Most of you were mere children when nine years ago the Deepwater Horizon rig in the Gulf of Mexico exploded. Eleven lives were lost and it triggered an uncontrollable oil spill. I was the Director of the U.S. Geological Survey at the time, and the Secretary of the Interior dispatched me to the Gulf of Mexico to oversee a team of US government scientists and engineers working with BP to contain the oil and plug the well.

I had been sent to the front lines of this crisis on account of my prior experience with deep-sea intervention and deep-sea drilling. But I was joined in Houston by many other talented government leaders. We spent months in Houston, with our sleeves rolled up, evaluating the viability of options to stop that spill. The US government and BP disagreed on many issues, but we all agreed that stopping the flowing well was the highest priority.

Although there was not a lot of trust between the two parties, we all agreed that we needed to rely on science and engineering to solve the problem. And, if at any time there was a difference of opinion on the best path forward, we would let the rules of science guide us on how to resolve our differences. We would gather evidence, we would share our data, and we would independently check each other's work until we resolved the disagreement. By relying on the scientific approach, we were able to stop the spill by deploying novel technologies.

Now imagine instead that the Deepwater Horizon oil spill were to happen today. What would be the approach in the post-truth era of fake news and distrust of expertise?

Perhaps in today's environment US politicians and BP business leaders would not trust scientists to solve the problem. And science and engineering might not prevail in plotting an action in something as important as capping the well. In such an environment, business leaders

at BP might insist that since they were paying for the work -- and they are shouldering the liability -- they had the right to dictate the course of action.

Political leaders might balk at granting permission for well-control if BP was calling the shots without government input. BP business leaders and US politicians would have no common set of rules, like the rules of sciences, for deciding how to resolve their differences short of tying up the matter in the courts. All the while, the well continued to spill oil.

I'd like to think that such a scenario is far-fetched, but, nevertheless, the overall recent trend to use gut instinct and the preferences of special interests to replace science and evidence is having real-world consequences. There is no better example than the denial in the US of the urgent need for action on climate change.

[CHEERING AND APPLAUSE]

This places the US in the singular position of being the only nation on earth to opt out of the Paris Accord. Now, I don't want to give you the impression that science and scientists are perfect. They are not. There are bad apples in science, and even good scientists can make mistakes. But the rules of science have self-correcting mechanisms built into them to help ferret out fraudulent work and to correct honest mistakes. This is why when they are found they are front-page news.

It is the duty of scientists to call out anyone who violates the public trust.

So now, in closing, whether the issue is health care, economics, education or immigration, thanks --

[TRAIN SOUNDS]

[APPLAUSE]

Thanks to your university education, you have been instilled with the larger world-view to see beyond just your own lives and that of your generation. Your choices will have profound and lasting impacts on others near and far and the world that your children and your grandchildren are going to inherit. I call upon to you make those decisions based on the truth.

When you see junk science, call it out. When you don't trust the sources, call them out. When your friends share misinformation on Facebook, set them straight. I do this all the time. In a nice, respectful, fact-based nonjudgmental way. But don't let them get away with it. Because the truth does still matter.

Now, there are some moments in this lifetime when we will feel large and important, such as this moment for all of you, in receiving your degrees. And there are other times when we feel very small and insignificant, for example, when we stare up at a clear night's sky to ponder the vast regions of space and time. But never for a moment doubt that your choices matter.

Trust wisely my friends and help others do the same. The future depends on your choices, and just importantly, how you make them. I'm counting on you 2019 graduates.

Trust well!

Thank you.

[APPLAUSE]