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**Engineering Change**

Good evening. It is an honor to be here and to witness the up-and-comers who are sure to make a positive impact in the community. Thank you, Mr. Patterson and the selection committee for the invitation to serve as your keynote speaker this year.

As you know, the areas of science, technology, engineering, and mathematics (STEM) have become the focus of many discussions covering a variety of sectors during the course of the last several years. Dips in the economy have a tendency to shift the focus from education to “applied learning” as does the perception that we are not as far ahead of the rest of the world as we believe we should be.

As more and more college students set their sites on jobs in the STEM fields, we tend to forget about individuals throughout history who achieved great things in science and engineering but who had no formal training as either a scientist or an engineer. Examples of such individuals include Benjamin Banneker, Benjamin Franklin, Leonardo da Vinci, Madame Curie, and George Washington Carver. It was the culmination of their experiences, curiosity, and critical thinking that led them to the height of science, discovery, and creative thought. There is an important lesson to be learned from these individuals from long ago that is quite relevant today and that is just because you haven’t been formally trained to do something does not mean you can’t do it! If that were the case, we’d have fewer entrepreneurs and fewer “before their time” innovators: something to ponder as we consider the issue of “change.”

In today’s world we cannot all be lucky entrepreneurs. To get ahead and to make an impact, you will need a combination of formal education, creativity, luck, and a network of supporters. All of these things I have had.

Just recently there were three Earth-like planets discovered orbiting a dwarf star. CNN reported “for the first time, researchers have discovered three potentially habitable, Earth-like worlds orbiting an ultra-cool dwarf star 40 light-years away in another star system. It’s known as TRAPPIST-1.” How exciting! You could be the one to discover human-like organisms on another planet. You could be the next iteration of Larry Page and Sergey Grin, the founders of Google. Or, you could be the president of the United States.

Regardless of what you *can* become, you need to be ready for the next chapter. You cannot be a passive observer of the world around you. You must be active, engaged, and prepared. You need not listen to people who don’t believe, people who don’t understand why, people who may try to deter you from your aspirations. As the old adage goes, you cannot soar with eagles when you hang out with turkeys.

I stand here looking out at this audience. I see faces of people I don’t know but I know. Formally, I don’t know you, but experientially I know many of you. I’ve been where many of you are. Bright. Inquisitive. Reasonably good-natured. Observant. And, wanting. Wanting to do something that will make your family proud. Wanting, quietly, to make a positive and lasting impact on the world in which we live.

I discovered chemistry in the eleventh grade and found a passion for science. In the twelfth grade, I took pre-calculus, physics, and advanced biology because I felt that I needed to catch up. My parents are not scientists. My parents have no advanced degrees. In fact, neither of them went to college. What they do have is fortitude, drive, determination, and integrity. What has been the impact of these four characteristics on me? I earned a PhD in biochemistry and became a college president. Let’s spend a few moments thinking about these four powerful words.

* Fortitude
	+ Mental and emotional strength in facing difficulty, adversity, danger, or temptation courageously.
	+ You must remain strong in the face of any adversary, any problem, and any temptation. Let nothing get the best of you.
* Drive
	+ To strive vigorously toward a goal or objective; to work, play, or try wholeheartedly
	+ This means you must work toward the goal and let nothing turn you around.
* Determination
	+ The act of coming to a decision or of fixing or settling a purpose.
	+ You should stand firm in your beliefs. But, you must also be flexible.
* Integrity
	+ Adherence to moral and ethical principles; soundness of moral character; honesty.
	+ You want your word to mean something.

What has motivated and inspired me over the years has been a strong sense of my responsibility to my family and a deep desire to make a difference. I very much believe that education is the key to curing many of our societal ills. As then Senator Barack Obama said in a speech in Chicago in February of 2008, “Change will not come if we wait for some other person or some other time. We are the ones we’ve been waiting for. We are the change that we seek.”

How does one engineer change? One thing for certain: no one person can be a change agent alone. There are some impediments to institutional or cultural change. According to Lunenberg, these impediments are

* Culture and tradition – There is a saying that institutional culture eats planning for breakfast every day. You must take the time to understand the culture and the significance of institutional traditions. There is no getting around that.
* Fear of the unknown – There are some who would say, why change? Knowing what to expect, even when you are unhappy, is easier for them than confronting and adjusting to something that is new and different.
* Politics – One must be able to identify who the players are and understand and appreciate the relationships between individuals if you are to effect change.
* Resources – Change comes at a cost and you must have the human, financial and physical resources to make it happen
* Trust – If there is no trust, there is no progress
* Inertia – Saul Alinsky wrote, “Change means movement. Movement means friction. Only in the frictionless vacuum of a non-existent abstract world can movement or change occur without that abrasive friction of conflict.” Thus, it is just simpler not to rock the boat and keep things where they are than to change.

But, in spite of these impediments to institutional change, how does one effect positive change? Over my career, I have been able to effect cultural and institutional change everywhere I’ve been – from Xavier University in New Orleans, to the Howard Hughes Medical Institute, and Lewis & Clark College. In my current position at St. Mary’s College of Maryland I have no doubt that my penchant for effecting change will continue.

What are characteristics of effective change agentry? Lunenberg cites ten.

* Hemophily (similarity between the change agent and the institution). Do you feel you belong there? Do they feel it’s a good fit?
* Empathy (understanding the feelings of those who will be affected by the change).
* Linkage (collaborative activities between the affected and the effector). This facilitates buy-in.
* Proximity (physical and psychological closeness).
* Structuring (ability to plan and clearly organize activities). Assumed “chaos” provides an excuse for the naysayers not to engage.
* Capacity (the institution’s ability to provide resources)
* Openness (a willingness to hear, respond to, and be influenced by others)
* Reward – There must be something for everyone to look forward to. People must feel appreciated if they are going to work towards change.
* Energy (both the change agent and the institution being willing to give all you have to the effort).
* Synergy (all parties and activities must be devoted to success).

Thus, engineering change takes a lot of effort on everyone’s part and the stars must be aligned. Not everyone can be an affective agent of change, those who are share several characteristics (Lunenberg).

* Power – You must be in position to effect change.
* Vision – You must be able to see the path forward and believe in what can be.
* Bravery –You must be strong, focused, and believe that you can navigate the good and the bad.
* Balance (Passion without emotion)
* Motivation – You must want it.
* Support

Support is critical if you are to engineer change. Throughout my life, individuals have appeared at critical junctures to provide advice and guidance. As you advance in your career and realize your life goals, it is essential and necessary for you to remember that that which you have achieved and will continue to accomplish is the result of years of effort and countless numbers of individuals supporting you. As John Wooden is credited with saying, “Talent is God-given. Be humble. Fame is man-given. Be grateful. Conceit is self-given. Be careful.” Change is inevitable. Be persistent yet patient.

To engineer change, you must first and foremost know yourself. And, just like Benjamin Banneker, have faith in your ability to get it done!

Thank you.

References

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