Good afternoon everyone -

I’d like to begin by taking a moment to thank the Texas Academy of Sciences for both its recognition and its invitation to speak here today. It’s an honor to be able to interact with amazing educators, scientists, and other STEM-related colleagues gathered in this room. It is my hope that my personal insight and perspective on education will provide a good starting point for further discussions as we move forward together for the betterment of our students and the betterment of education in Texas.

Education is a topic near and dear to my heart, partly because I live it every day. Every day there is some new emerging buzzword, methodology, or even a technology that promises to streamline and refine the teaching process. Every time we turn there is a brand new technique for an educator that promises to provide meaningful content to all of our students and to be the magic ticket for passing the STAAR test. However, lurking beneath all of this educational lingo lies one inherent flaw within the system. No two students are alike.

People are different. Thank goodness we are. How boring would the world be if we were all the same? Every one of us, mundane and predictable in our progression through life. Much of the progress of humankind we owe to those relentless people who have stepped beyond the mold that society has placed on them. The differences among the human race has been our strength. Yet, in the education system, our differences become our weaknesses.

From birth, children are exposed to a multitude of variables that affect their ability to flourish, grow, and learn. For example, some children may be born into a low income area with limited opportunities, while others are born into a more affluent family with better circumstances. There are children with consistent and encouraging support systems, while others barely get noticed in their own homes. There are factors such as child hunger, mental capabilities, family backgrounds, limited education, and other factors that students face every day. However, these differences are not accounted for in our current educational system.

Unfortunately, the current system advocates a “one size fits all” approach when discussing and implementing educational goals. Administrations are consistently preaching about differentiated instruction. That each student is different. Yet ironically, for nearly a century, schools in the United States have been built on the assumption that all children should be treated more or less the same. Students are taught with the same campus plan, with the same curriculum, in the same timeframe, with the same instruction. Each student is even tested in the same way. Additionally, the overall success of each student is measured the exact same way. Largely by an accumulation of scores in subjects taught in isolation from one another. Everything comes down to a single score. A score on the STAAR, a score on the end of course exam, or a score on the SAT, is the deciding factor for student achievement. We do not take into account mental capabilities, determination, or even effort. Effort of a lower than average student that may stay up all night studying to earn a growth of merely 8 points. But a growth is a growth and should be celebrated none the less.

In following this “one size fits all” approach, we provide a great disservice toward the very students we are striving to help. How can we ensure that our student’s today effectively understand and comprehend different subject matters when we do not acknowledge the individual student?
Nowhere is this question more applicable than in standardized testing.

In the last decade or so, the main approach to reaching educational goals and measuring student success has been through the use of standardized testing. Although the original intent of this approach seemed to be a valid line of thinking, it has become increasingly apparent that lawmakers have become more focused on what standardized tests do measure, and not what they are lacking. Standardized tests do not account for creativity, critical thinking, resilience, motivation, persistence, curiosity, and endurance. These tests do not take into account whether a child has had a full night of sleep because they were up all night taking care of their sick brother. Or whether they ate dinner because there just wasn’t enough for everyone to have a plate. Or whether they are limited in English because both of their parents only speak Spanish or are hearing impaired. Often, standardized testing is simply unrealistic in its assessment of failure or success simply because it does not acknowledge the variables. Is it right to compare the success of an economically-challenged, low income student against the success of a middle-class student with an effective support system. Is it right to judge the student in special education by the same standardized test that the GT student next to him has just ace? Are we setting up these students for failure? If I have learned anything from teaching it has been that all students can learn and succeed, but not all on the same day, and not all in the same way.

There are many drawbacks to standardized testing. One is the lack of creativity and imagination in the classroom. By constantly giving benchmarks and district self-evaluations in order to monitor progress, we are taking away time from students to explore among themselves, follow their natural line-of-thinking, and building critical thinking.

Another drawback is the use of standardized testing as the chief accountability for students, educators, and schools. This has led to an increase of teachers and educational facilities becoming fearful of negative repercussions. If certain scores aren’t met, a teacher can look forward to being place on a “growth plan” to make her a better teacher. Many teachers are told to drop everything and “teach to the test” to ensure that their school scores are within the acceptable range. What happened to allowing students to explore science rather than memorize facts to do well on a multiple choice test? In doing this, we are actually hindering our students. This leads to a shrinking of the curriculum where subjects such as music, art, social studies, and even science are de-emphasized. We are raising children in a sterile, rigid, and highly structured environment, and creating a generation of students who can follow the rules, sit for long hours, and mark bubbles on a test.

In turn, educators become more fearful of the consequences for scores not meeting mandated levels. Many teachers have opted to leave the education system and pursue other fields. The lack of freedom in teaching coupled with the fear of not measuring up, has created a void of highly qualified teachers.

This is not to say that there shouldn’t be some form of assessment. In order to better continue refining and evolving our teaching methods and education system, assessments are needed. However, we as citizens must be willing to constantly reassess the education system and testing methodologies and be willing to make drastic changes if necessary – even if it takes completely revamping our current approach. We must simply prioritize providing an education to our students rather than molding them to meet certain statistics.

I once read that you can’t standardize great teaching. Teaching is an art. The minute you try to standardize art is the minute it loses the very thing that makes it captivating.
Even Albert Einstein once said, “Everyone is a genius. But if you judge a fish on its ability to climb a tree, it will live its whole life believing that it’s stupid.” Maybe we could better understand how to assess our students if we better understand how they learn in the first place. In our effort to see that every child has a chance, we must assure that each child has an equal opportunity, not to become equal, but to become different; to realize whatever unique potential their body and mind possesses.

As we move into the 21st century, researchers and scientists have begun to take a closer look at exactly how children process and retain information given to them. Not surprisingly, preliminary data appears to show a trend of increased learning. The increased learning occurs with the increase of interactive activities and multimedia technologies in both the classroom and home environments. In the past, it was believed that repetition was the most impactful on the retention of information, it is now becoming clearer that this might not necessarily be the case. Our students of today are not the students of yesterday. These students think differently, process information faster, and to be frank, use portable devices that have more capabilities than my computer in college. Why not use all this to our advantage? Balancing the use of multimedia applications with human social interaction can provide positive results in multiple areas such as critical thinking, problem solving, and social skills. Interactivity can be implemented in the classroom through:

- The use of play as an educational tool to improve essential skills such as reading and writing.
- The use of interactive learning to ensure children comprehend material provided to them.
- The use of interactive media and activities to improve motor control and skills of the students.
- And the use of interactive applications to allow students more control over their work and allowing them to work at their own pace. This results in increased feelings of independence.

There are also other benefits in the use of non-traditional approaches like:

- The use of gamification to reward students for their efforts. Gamification instills positive recognition for hard work and effort – not just end results – which in turn is more likely to encourage future effort by the students.
- Secondly, interactive media and applications allow for students to begin learning at an earlier stage of life. By immersing students into new ideas and concepts at a younger age, the learning process becomes more normalized.
- Also, Interactive applications and media can acknowledge children who are struggling with a concept or idea and adjust accordingly. By combining the end results with emerging technologies such as automatic application adjustment, issues can be more quickly discovered and resolved.
- Finally, technology can play to a student’s strengths. As many know, there are three major categories of learning styles: visual, auditory, and kinesthetic. By incorporating all three together with interactive media and technologies, students will develop new skill sets regardless of their personal learning style. This combination of styles will cater to their individual needs while improving their performance in all three areas.

Interactivity needs to be brought back to the classroom. To quote an unknown author, “One of the biggest mistakes made in education was the separation of learning from play. That’s like
trying to separate water from the ocean. Take it all out, and it becomes completely different. Something empty of life and hope.”

So where do I see education going in the 21st century? How can “play” be integrated back into the classroom to increase student engagement? As the world continues to move forward at increasing speeds, the patterns and routines of everyday life are changing. Whereas, in the past, work could only be performed during daylight hours, new advances and technologies allow for around-the-clock production and the human race has increased its workload and schedules accordingly. More than ever it’s becoming apparent that there is no one single approach or method to not only meet our goals in education but life itself. In order to meet the challenges presented by these changes, new exciting techniques are being examined and implemented in classrooms around the globe. One such approach can be found in the Steve Jobs Schools which are located in the Netherlands.

These institutions have embraced interactive learning by using technology. They allow their students access to data and information on a global scale. Teachers – in the form of coaches and mentors – work together with both the parents and the students to design learning to the specific student. The specialized learning is geared toward reaching the goals established by their individual education plans. Furthermore, these institutions have also acknowledged the presence of shift work, multiple schedules, and the occasional unexpected circumstance which hinders a student’s ability to attend class. To offset these issues, the school building is open year-round with more flexible attendance policies that allow for adjustments to be made. Creativity, flexibility, critical thinking and problem solving are all given top priority. However, the student’s social and emotional development is also emphasized. This unorthodox learning would be beneficial to all fast paced countries, including the United States.

Another approach closer to home would be to bring real world critical thinking into the classroom. The Student Spaceflight Experiment Program is a way for students to engage in real science, working with real scientists, in real time. It was launched in 2010 as a STEM education initiative by the National Center for Earth and Space Science Education. This program typically provides 300+ students across a participating community the ability to propose and design real experiments to fly in low Earth orbit aboard the International Space Station. SSEP is designed to embrace the Next Generation Science Standards and provides an authentic, high-visibility research experience to students by allowing them to conduct experiments in many diverse fields including: seed germination, crystal growth, physiology and life cycles of microorganisms, cell biology and growth, food studies, and studies of micro-aquatic life. Students from 5th to 12th are allowed to experience real world science by becoming scientists themselves.

As witnessed by both of these programs, non-traditional and interactive approaches can provide new avenues for increasing interest in all subjects. It can also provide experiences that allow the student to take charge of their own future through learning. All that is needed is the willingness to consider new techniques and allow teachers the freedom and time to expand beyond standardized testing.

As we all know, the education system is a complex institution that needs to be constantly reviewed and refined in order to meet the ever-changing needs of our communities. It is imperative that as citizens, leaders and educators, we must not restrict ourselves to outdated methods and techniques when presenting content to our students. Everyone in the educational process – from parents, to students, to teachers, and to administration – must be willing to “think outside of the box” and consider new approaches and avenues to meet our mutual goals. We
must come together and unify our standards in all disciplines and take into consideration what variables can affect student success. We must implement the strategies to address these variables, and provide an education as opposed to simply meeting metrics and quotas. Supporters of education must stand together on the front lines and demand change when needed. We must ensure that administrations understand and assist in achieving these goals, and above all, give teachers the time and freedom to teach without bogging them down with endless paperwork.

The United States must be willing to examine approaches taken by other countries. Are there elements that would be beneficial if we added them to our curriculum? Are there concepts and ideas which we could improve upon? What can we do together – both nationally and globally – to ensure the successful evolution of education for our children – the true future of humanity? After all, as Nelson Mandela once said, “Education is the most powerful weapon we have to change the world.”

In conclusion, I’d like to express my gratitude to the Texas Academy of Sciences as well as the members of the audience for allowing me to briefly speak here today. It is my hope that my remarks will stimulate new conversation and discussion about the state of education here in the United States, and I challenge each of you to go forward and interact within your communities. Only together can we continue to ensure the positive evolution of education for our students, our nation, and the world.