

DESIRE VS. FEASIBILITY: EDTECH IN THE TEXAS PUBLIC SCHOOL SYSTEM

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TABLE OF CONTENTS

ACKNOWLEDGEMENTS.....	iii
ABSTRACT	v
CHAPTERS	
I. INTRODUCTION	1
II. BACKGROUND	2
III. METHODOLOGY	3
IV. EVOLUTION OF THE CLASSROOM	4
i. Historical Background	4
V. COMPARATIVE ANALYSIS OF STATE LEGISLATION.....	7
i. Obama, Colorado HB 16-1198, and High Speed Internet	7
ii. Texas Funding Difficulties.....	13
VI. CONCLUSION	16
REFERENCES.....	19

ABSTRACT

The purpose of this research is to examine public school funding practices in the state of Texas and the ways in which it will affect the ability to supply proper means for immersion of technology based education curriculum in the future. This study consists of literature review, analysis and comparisons of state initiatives to implement technology-based curriculum, and observation of social changes in education. Throughout this research, it has been identified that the growth of societal dependence on technology does not parallel with the growth of technological public school curriculum in the state of Texas. This study embodies disconnect between societal growth in technology and government support of this growth in public school education.

I. INTRODUCTION

K-12 schooling is a big deal. For parents, it is a process of their child's development through adolescence to adulthood. For students, it is a symbol of growth and higher achievement. School provides students with early social skills. Some of our most sacred memories were made inside classrooms and playgrounds. As we grew older, we began finding our niche. Some of us became athletes, some musically inclined, artistic, militaristic, or positively individualistic. School provided us the chance to choose our tribes all while working to receive hopefully, noteworthy educations. School molded us into who we are today and who we will become in the future. School, as we have been taught, is a big deal.

The importance of education is something heavily stressed throughout our culture. It's rare that a child grows up free of pressures to "stay in school" or continue on in higher education, and one's degree of success is now heavily determined by their academic achievements. However, it is also rare that a student gracefully upholds these standards minus exterior forces hindering their academic success. The question then is, what exactly the forces that work against them are.

When a student shows declining progression in academia, many presume it is due to the lack of motivation, willingness to learn, or self-discipline. Others may argue that educators are the issue, concerned that many are unhappy with their jobs, or that they aren't qualified for their positions. Culturally, we have viewed the education system on a micro level scale. Student blame for failures are not often directed toward actual school

districts or education boards, but rather the individual school itself. Many people, I have found, have forgotten about the role of state government in the system of education.

It is becoming increasingly difficult to argue that our world is not one ran by technology. Every year, new devices enter the market by consumer demand, medicine enhances by the teamwork of natural science and computer use, and the lifestyles of the general population become increasingly dependent on communication via smartphone. Every day technology serves as a new medium of which humans communicate, learn, and live by.

As the dependency of technology increases, job markets begin to seek out those with skills necessary to keep up with its development and necessity in our society. The issue before many school districts in the United States now, is the ability to provide students with resources that will better them as citizens prepared to graduate into a technological society.

The state of Texas has witnessed the hardship of creating equitable forms of funding practices, which in turn has damaged the quality of many of its public schools. Ironically enough, as the state of Texas increasingly becomes the new hub for the technological job market, its schools continue to struggle to implement EdTech curriculum for its students. This in turn separates the desire from the actual feasibility of incorporating technology-based curriculum to guarantee that its students are prepared for the future job market.

II. BACKGROUND

The state of Texas has endured numerous instances where its educational practices and functions have been challenged. (Koppel) For the purposes of this study, I have observed and researched the ways in which Texas' public school funding allocation has historically and currently affected its students, especially as the new desire for technology based curriculum surfaces. Due to many of my findings, I have created an emphasis on landmark legislative and judicial decisions that have particularly taken place within Bexar County. Using said decisions, I have observed and analyzed the lasting economic and cultural effects that they have placed within the Texas system of education. I also discuss the new implementations of legislative action as they pertain to changes in public school funding practices and the future of technology immersion into school curriculum. I didn't quite know where my studies would initially lead me, but I do know that what I did discover was nothing short of disconcerting.

Through analysis of many landmark cases such as *San Antonio ISD v. Rodriguez* and *Edgewood ISD v. Kirby*, and pieces of legislation like the "Robin Hood Plan," I have discovered that each has had a lasting effect on Texas's educational institution. These political facets have directly influenced the inherent structure, culture, and attitude toward Texas public school education whether they are still currently enacted or not. My discoveries have thus led me to question how much control students really have over their academic success. As the American job market increasingly becomes eager to hire those with experience with technology use, will Texas' students be ready to graduate into that environment? With current funding practicing being held into implementation, will

students receive the proper tools and resources necessary to set them up for success in this field?

III. METHODOLOGY

This research study was conducted primarily through literature review. The literature review consisted of analysis of academic journal articles and state and local legislative bills and amendments. For comparative purposes, review of legislation played a pivotal role in determining the current state of Texas' implementations of EdTech curriculum in relation to other states. In an effort to fully grasp the changes of the role of technology in society, a holistic approach to observation of these changes was utilized to gather data. This was vital in regards to determining the differentiation between the desire versus the feasibility of EdTech in Texas public schools. In regards to current Texas legislative action, first-hand experience of sitting in on committee hearings and floor debate was used to note how much the topic of technology in classrooms has been discussed in the 85th Texas legislature and what pieces of legislation have been passed or voted against in that regard.

IV. EVOLUTION OF THE CLASSROOM

i. Historical Background

The American education system has historically been perceived as oppressive by nature. Prior to early colonization, primary education was granted only to the children of white, wealthy, plantation owners. Social class then, was determined by one's accumulation of land, ethnicity, and inherited wealth. (Frazier) It wasn't until the early 1800s that an official school system began in the United States. The "Common School

Movement” was a period in time where activists sought to create educational institutions open to the public, rather than being solely private. The movement itself, however, was still very oppressive toward minority groups. This was also the time in which government began to control and intervene with the educational system.

After years of improving upon and expanding the nineteenth century concept of the “Common School,” public schools nation-wide have become progressively accepting of a wider range of ethnicities and social classes. After hearing historical cases such as *Brown v. Board of Education*, the United States Supreme Court made a landmark decision in declaring that separate does not mean equal. (BROWN v. BOARD OF EDUCATION) As Chief Justice Earl Warren stated in 1954, “It is doubtful that any child may reasonably be expected to succeed in life if he is denied the opportunity of an education. Such an opportunity... is a right, which must be available to all on equal terms. Separate educational facilities are inherently unequal. “ Since then, public school education has positively become one of the most utilized social institutions within the United States. But though public school is now accepting of all races, ethnicities, genders, and social class, a new issue has developed. Perhaps the separation of educational facilities based on race is in fact unequal, but what about the separation between the rich and the poor?

Nearly half of all public school institutions in the United States are funded through local taxation. This has generated a substantial difference in funding between wealthy and impoverished communities throughout the country. Because of this current system of educational funding, there is no uniformity to how much or how little school districts are receiving. (Koppel) This in turn has created disparity between states, cities,

and even local school districts. (Farr) As previously discussed, it has become apparent that minority groups, whether racially, culturally, or economically classified, have geographically been pushed to live in less pleasing areas by capitalistic forces. This type of segregation has tremendously affected school systems throughout America and continues to exclude minority groups from equal educational opportunities.

Social scientists and human geographers are realizing the unfortunate consequences of the unequal distribution of educational funding within the United States. It has become increasingly common to find that smaller (in terms of student enrollment) public schools in wealthier areas are accumulating more state funding than much larger public schools within low-income areas. This has negatively impacted young students living in poverty to believe that they are unimportant to society. Schools within these poorly funded districts have increased in drop-out percentages and struggle daily for student retention. Many find it ironic, and perhaps disgusting, that poorly funded schools are struggling to provide students with textbooks and learning materials while wealthier districts have progressively provided their students with iPads, SmartBoards, graphic calculators, and eBooks as a means of establishing a world-class education. While public schools in the United States have overcome discrimination in regards to actual enrollment, perhaps it is still racially, culturally, and economically oppressive to those who are unable to live within wealthier districts.

As culture and society continue to evolve amidst time progression, the traditional classroom has seemingly remained the same for decades, if not centuries. Most public school classrooms today include standard desks for their students to sit in, and an educative style of teaching that primarily models itself after the traditional lecture model.

Granted, districts with higher monetary access to resources have had the luxury to incorporate things such as SmartBoards or even tablets for their students to use, the general model in which class is conducted remains one now used for centuries.

The general critique that some may have about enhancing technology based learning in the classroom today is that they fear students will increasingly become more dependent on computers and tablets and abandon the traditional style of face-to-face communication. This fear would serve as valid in the sense that technology be used for social reasons in the classroom, however, as technology continues to evolve globally, it is becoming apparent that school children need not to only know how to use it, but how it actually functions and works as well.

ii. Technology and education curriculum

V. COMPARATIVE ANALYSIS OF STATE LEGISLATION

i. Obama, Colorado HB 16-1198, and High Speed Internet

In an era of technological advancement, it has become imperative to obtain a general knowledge of computer use, as well as a basic understanding of its influence on the culture, economy, and job market within the United States of America. The accumulation of computer science-based skills has proven to be one of the most sought after characteristics business and corporations are looking for in potential employees market-wide. One may assume that the demand for tech-savvy employees would increase the implementation of computer science curriculum in educational institutions nationwide, but research is determining otherwise. (Jenkin)

On January 30th of 2016, President Barack Obama's Weekly Address raised a question regarding the issue of minimal computer science educational opportunities

within the United States of America. This address discussed the fact that only 28 out of the 50 states allow some type of computer science credit to count toward a high school diploma. This leaves 22 states trailing behind the tech era by opting out of encouraging diploma approved computer science coursework. The address also mentioned that only a mere one-fourth of all K-12 public schools in the United States have actually implemented computer science courses into their curriculum. The president stated that, “...we have to make sure all our kids are equipped for the jobs of the future, which means not just being able to work with computers, but developing the analytical and coding skills to power our innovation economy.” He further emphasized the importance of this issue discussing that, “In this new economy, computer science isn’t an optional skill... it’s a basic skill.”

For years, President Barack Obama as well as many non-profit organizations such as code.org have emphasized further development of computer science curriculum in public school institutions. On April 21, 2016, Governor of Colorado John W. Hickenlooper signed into law House Bill 16-1198 implementing a law allowing computer science courses to fulfill high school graduation requirements. The bipartisan bill was sponsored by Representative Daniel Pabon (democrat), Representative James Wilson (republican), Senator John Tate (republican), and Senator Andy Kerr (democrat). It was further supported by the House Education Committee, state representatives Pabon and Wilson, Arndt, Duran, Fields. Garnett, Hamner, Kraft-Tharp, Lee, Lontine, Melton, Mitsch Bush, Pettersen, Priola, Rosenthal, Ryden, Salazar, Singer, Tyler, Williams, Winter, Young, and Hulinghorst, as well as state Senators Tate and Kerr, Carroll, Guzman, Heath, Jones, Kefalas, Newell, Todd, and Ulibarri.

Titled, “Computer Courses Fulfill Graduation Requirements,” the general assembly found that HB 16-1198 recognizes that “Computer science and computer skills are widely recognized as valuable assets in the current and future job market.” (Colorado HB 1198) It was first introduced as an act concerning computer science courses fulfilling certain graduation requirements, directing the state board of education to encourage public schools to accept computer science coursework in replacement of other mathematic and science coursework for graduation eligibility.

The first section of the bill discusses the benefit students in Colorado would receive from taking computer science and coding courses in high school, offering the suggestion that “High school students who are exposed to computer science and coding courses in high school are more likely to take such courses in college,” and that “many high school students are not taking computer science and coding courses because they are elective courses and do not count toward graduation requirements.”

Mentioned within the bill was a reference to code.org, a non-profit organization devoted to expanding the study of computer science within schools and educational institutions as well as assisting in outreach for female and minority encouragement of involvement in the field. The bill references code.org’s research study which concludes that, “In states that count a computer science course as either a math or science credit toward graduation, the average class size is fifty-three percent bigger than in states where computer science is only an elective.” (Every child deserves opportunity) This data emphasizes the bill’s intention of not only seeking to further computer science education in high school curriculum, but to also increase the number of Colorado public school students chances at graduating from high school on time.

The bill further encourages all Colorado school districts to “treat computer science and coding courses as a mathematics or science course and count completion of a computer science or coding course toward the fulfillment of any mathematics or science graduation requirement.” The encouragement and permission for Colorado state public schools to implement the usage of computer science based coursework to substitute mathematics or science courses is expected to drastically increase and assist Colorado high school seniors graduate on time with an enhanced knowledge of this particular field. While it emphasizes high school student benefits, it goes on to describe revised statutes to also cater toward preschool, elementary, and secondary adoptions of the bill in Section 2.

Section 2 is much more brief in comparison to section 1 of the bill, however it declares that the Colorado State Board of Education, “shall adopt standards that identify the knowledge and skills that a secondary student should acquire related to computer science...” This section specifically identifies code writing as a potential computer course to be considered, and encourages local education providers to consider the implementation of the standards set forth within the approved bill.

The approval of this bill is geared toward benefiting future generations in enhancing their overall quality of skillset in computer science. As previously mentioned, code.org, a non-profit organization that stood in coalition with the support of HB 11-1198, has emphasized the importance of computer science implementation in school systems nation wide. Spokesperson for code.org Hadi Partovi gave a TEDTalk titled, “Computer Science is Foundational,” backing many of the concerns and claims made within the bill. The basis of his talk catered to the idea that, “computers are changing everything, yet most schools don’t teach computer science.”

Rather than placing a general emphasis on coding and software development, Partovi identifies that the development of computer science curriculum in public schools will benefit students in a plethora of occupations, rather than strictly computer programming. He states that, “Every industry is desperately trying to hire computer programmers...” as the demand for experience and knowledge in technological advancement increasingly becomes imperative to almost every working force. The implementation of statutes such as that presented by HB 11-1198, will, according to Partovi, assist in the development of student skills pertaining to, “...logic, problem-solving, and creativity.”

Much like President Barack Obama, Partovi suggests that, “Our kids should be learning computer science... learning about how technology works, how software is changing our world, and how to participate in that world.” (T.) He continues to raise the question as to whether or not public schools are willing to accommodate their curriculum to a changing culture and economy, and argues that the further emphasis of computer science based curriculum can greatly benefit the middle and working classes in the future.

While it has increasingly become a popular concept to begin further implementation of technological exposure in classrooms, there are still some parties who view state legislation such as HB 11-1198 as ineffective and hindering toward genuine creative thinking. According to an article titled, “Tablets out, imagination in: the schools that shun technology” posted by *The Guardian*, the Organisation for Economic Co-operation and Development (OECD) has suggested that, “education systems that have invested heavily in computers have seen no, “noticeable improvement” in their results for reading, maths, and science...” The Waldorf School of the Peninsula is an example of an

educational institution that eliminates technology in curriculum and instead creates an environment where teachers, "...encourage students to learn curriculum subjects by expressing themselves through artistic activities, such as painting and drawing rather, than consuming information downloaded onto a tablet." (Jenkin)

As a whole, Colorado HB 16-1198 has been one of few initiatives in recent years to further implement the study of computer science into public school education curriculum. This bill takes into consideration the opportunistic benefits of technological skill development and seeks to enhance student's future ability in remaining competitive in a technologically driven workforce. It has also been approved on a basis that it will further assist high school students graduate, as computer science courses will be considered for mathematic and science core credits, rather than strictly electives. There has been much debate on whether or not the implementation to further computer and technology exposure serves as effective in the classroom, however many politicians and education based non-profit organizations continue to press its importance.

The enactment of Colorado HB 16-1198 is a pure example of a societal desire for implementation of technological curriculum in public schools. As one of the leading states implementing such curriculum, Colorado is beginning to set the precedent for other trailing states to look up to. What states such as Texas are beginning to witness, is that their current methods of funding allocation, access to resources, and overall push for technological improvement do not meet standards necessary for further implementation.

The state of Colorado has long established requirements for its students to take computer science courses, specifically, courses that pertain to computer coding, software development, and robotics. Texas, on the other hand, has yet to mandate that all public

schools require this type of education for their students. In its 85th legislature, the Senate and House of Texas made a comparatively small effort to expand technological resources to its students. The proposed bill mandates that a portion of the budget be allocated to provide high speed internet to public schools state-wide, regardless of their classification of being located in a property-poor or property-wealthy school district. This implementation appears to be a sign of progress, but it is evident that it seems comparatively dated to computer science legislation being passed in other states.

iii. Texas Funding Difficulties

By observing current literature, I noticed that this topic has already been heavily discussed and studied from predominately economic viewpoints. Most of the articles that I came across emphasized the state budget system and its clash with having enough to provide for public schools. This ultimately led me to the repetitive exposure of the, “Robin Hood Plan.” The “Robin Hood Plan” was a piece of legislation that was enacted by the state of Texas in 1993. In its purest form, it was designed to keep wealthier public school districts from being able to completely trump poorer districts in regards to providing more expensive benefits. In short, any excess funding that exceeded the allotted cap of \$1.50 per \$100 of assessed property value, was taken from the property-rich districts by the state government and distributed amongst property-poor school districts. (Farr)

While on paper this piece of legislation seemed to balance the inequities of funding distribution, many believed otherwise. Taken from “The Political Economy of Public School Finance,” Dr. Linda M. Loubert, a professor of economics at Morgan State University, suggests that, “To some extent, the situation appears to be a vicious circle—

inequities in funding cause poor performance, driving property values lower, leading to a smaller tax base, and therefore, less funding.” (Loubert Pg. 1-2) Dr. Loubert, as well as many other academic scholars, believe that the dispute over “Robin Hood Plan,” otherwise officially titled Senate Bill 7, are strictly a matter of the state overpowering its system of education. She again addressed the severity of this inequitable balance of power as she discussed how:

“The debates and lawsuits that accompanied this piece of legislation clearly illustrate the separation of political power in our nation. The legislative body may set the rules and laws for property taxes, but it is the court system that defines the constitutionality of those laws. This is the dance of powers that surrounded Senate Bill 7.”

Though she was very reluctant to address positives of this bill, there are some who believe that Texas had been heading in the right direction. Shelley Dahlberg, a former lawyer for the Texas Attorney General Office, claimed that, “Districts and parents received the vast majority of what they requested,” (Koppel) Christopher Diamond, a representative of a coalition of business groups in Texas also added that, “Money isn’t the only issue and it’s not the only solution.” (Koppel)

Article 7 of the Texas Constitution states that, “...it shall be duty of the legislature of the state to establish and make suitable provision for the support and maintenance of an efficient system of public free schools,” so if money isn’t the only issue or solution, what is, and what can be done about it? In a review of the decision of *Edgewood ISD v. Kirby* titled, “*The Edgewood Drama: An Epic Quest for Educational Equity*,” J. Steven Farr and Mark Trachtenberg give background on increasing financial disparities between

schools within Edgewood ISD and schools within the Alamo Heights area. In the review, they discuss how, “The motivations for education equity includes lofty, romantic ideals of equality and excellence,” (Farr and Trachtenberg) identifying the differences between romanticism and reality in state legislation. *Edgewood ISD v. Kirby* was but one of the first cases that truly identified how little the voices of the people meant when it came to dollar signs and politics. “Many Texans realized for the first time that years of discussion and proposals had actually done little to affect the inequity of the state’s system,” said Farr and Trachtenberg. The idea that the voices of those being directly overpowered by the actions of legislatures quickly became a trend in my research. It became even more so apparent, that the lower the class a person belonged to, the more silenced their voiced became.

San Antonio ISD v. Rodriguez was one of the first United States Supreme Court cases that truly exemplified the spatial divide between the property-rich, and property-poor public schools. This case is historical in that observed how popular rhetoric and attitude toward education conflicted with true narratives of the state of education. In “A Right to Education?: *San Antonio v. Rodriguez* and the Need to Re-Examine the Discourse of Equality in Education,” Shan Mukhtar observes these cultural conditions, stating that, “...In arguing that education is a fundamental right and wealth is a suspect identity category, the parents and children in *Rodriguez* were also implying a racialized pattern across these wealth disparities and educational disadvantages...” continuing on by describing that “...the Supreme Court’s decision... limited the importance of education as a “fundamental right” or even a significant component of the fundamental rights guaranteed to all Americans.” (Mukhtar)

The role of government serves an extremely important role in the American society. In its pure form it is designed to ensure that the concerns of the general public are addressed and acted upon. This entity is intended to be a higher voice of the people, but it is all too common to find that it is the opposite today. Like a silencer on a loaded gun, the ongoing issue of funding inequities within the state of Texas remains a silenced topic, yet continues to take shots at the future of student's success in education. Students and parents complain about unacceptable school lunches, the lack of educational resources, and unavailability of extracurricular activities, yet few are willing to discuss the inequitable allocation of funding between school districts. The actions of state legislatures are speaking much louder than the words of its constituents.

VI. CONCLUSION

As a collective society, the desire for new developments in technology continues to heighten. Cars are now tested to be autonomous and driver-free, cellphones are turning into watches, and automatic machinery continues to operate most manufacturing processes. Our dependency on the immediacy of information via technological use serves as the key force of our societal operation. In order for the continuance of this progress, it is imperative that the children of the United States are not only serving as consumers of technology, but also its creators. The current debacle of whether or not to provide resources for immersion of EdTech curriculum in Texas public schools shines light on the new chapter emerging out of the evolution of the classroom.

Throughout the years, this issue has incrementally become bi-partisan. Lawmakers within the state of Texas are realizing the detrimental economic impact of students not being prepared to graduate into a technologically functioning workforce. Many have dedicated more time to discuss possible solutions and have rooted one of the primary causes of lack of resources to current public school funding practices. Currently during the 8th Texas legislative session, Senator Larry Taylor seeks support of SB 2145, which according to the Texas Tribune would, “...simplify the patchwork of formulas the state uses to fund public schools.” This bill is also projected to contribute approximately \$11 million more to Texas public schools than what is provided today, allowing for legislation that creates new means of equity across school districts state-wide. (Swaby)

The push for legislative action has increased substantially, but that doesn't mean it has been an easy task. Some lawmakers in the 85th legislative session have called for reallocation of budget funding to be placed into public schools. Representative Diego Bernal faced a loss this session as his amendment that called for a diversion of \$7.5 million from border security to public schools failed in the chamber. In a facebook post, he wrote about his bill stating, “25,000 Chromebooks for the \$ of 1 spy plane. #justsaying #txlege.” When asked if he had more amendments to be voted on that evening, Representative Bernal responding, “That was my one. Public ed is in better shape than usual (by TX standards) in this budget so that's where my focus was. Now trying to help and back up my colleagues.”

As the desire for advancements in technology continue to heighten, the legislative implementations for EdTech in public schools, while improving, still has

not matched in relation to its feasibility. Government action has always appeared to function incrementally, but it is apparent that the progression of technological advancement grows in bulk. In order for schoolchildren to be well prepared to be functioning members of society, school systems must cater to the evolution of technology and allow the classroom to follow in its natural course. Many lawmakers are beginning to recognize that an investment in schooling is an investment in the future. It is vital that these lawmakers understand the urgency in which our society continues to grow and change.

If the Texas legislature continues to not only discuss alterations of funding allocation practices and EdTech curriculum, but also successfully places implementations, Texas public schools will undoubtedly thrive in modern society. Technology is now influencing the way that humans communicate and function in their entirety. Though it may be an intimidating thing to process, it is now time for public school classrooms to adapt to new changes for the sake of students being marketable in the workplace and contributors of progression in the globalized society. This, is a big deal.

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