

THE HUMAN EQUATION:

HOW COMPETITIVENESS AND HUMAN
CAPITAL DEVELOPMENT INTERSECT IN
OKLAHOMA



WES WATKINS CENTER FOR
**INTERNATIONAL
TRADE DEVELOPMENT**
School of Global Studies and Partnerships



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EXECUTIVE SUMMARY

The genesis of this report began with the question, “How can Oklahoma use its resources to create a workforce that contributes to Oklahoma being more productive, profitable, and globally competitive?” We contribute to the existing information surrounding Oklahoma’s workforce development, also known as human capital development, by examining this question through frameworks based on economic theory and then introduce solutions that could move Oklahoma toward improved outcomes.

Our first contribution is a discussion of total factor productivity (TFP) and how this relates to the concept of global competitiveness and can be improved upon by investing in human capital. Human capital contributes to TFP by increasing the rate of innovation through the effective use of inputs in increasing production. International trade also plays an important role in increasing TFP via access to a larger market. As Oklahoma increases TFP, the state will increase its trade competitiveness and economic growth, which will increase the state’s capacity to develop human capital; creating a virtuous cycle.

The second discussion topic is the role of economic geography and the formation of industry clusters. If the state can successfully develop and sustain these clusters, it will not only benefit firms, but the workforce will also see improvements in the availability of high-skill and quality jobs, thereby averting the vicious cycle and risk of a low skills equilibrium. To do this, Oklahoma will need to work strategically to attract, develop, and retain a quality labor force through improvements in human capital. Capitalizing on economic geography can enable companies to focus higher value activities in Oklahoma, creating a long-term investment in the state and greater company commitment to increasing Oklahoma’s global competitiveness.

The last discussion topic shows how human capital goes beyond education and includes health services, proper nutrition, quality education at all levels, and leisure. In this report, we briefly highlight current challenges that exist in the workforce and education systems, which are important factors that influence the success of human capital development. We address the state’s ‘Brain Drain’ issue through a solution we call The Human Equation where retention and attraction of skilled talent is reflected through state-level policies that focus not only on the bottom line, but also reflect what talented professionals would expect in terms of a good quality of life.

We end our discussion by proposing four partnership solutions between business, government, and education sectors that are based on the discussion topics covered:

1. *Encourage organic talent development or formulate “exit strategies” for employees whose jobs and livelihoods will be affected by increased automation that will flow into service sector related jobs.*
2. *Develop partnerships between educational / training institutions to develop apprenticeships or other mechanisms which aim to fill the future gaps in the talent pipeline.*
3. *Employ higher rates of international students graduating from Oklahoma’s colleges and universities with advanced degrees in needed fields to address short-term skill shortfalls.*
4. *Introduce a “Grow Your Own” and “Ecosystem Approach” to Statewide Entrepreneurial Endeavors*

We believe that by addressing our current and future human capital needs in a holistic way, we can ensure a more productive, profitable, and globally competitive future for the state of Oklahoma.



Andrew Ranson, CITD Director

INTRODUCTION TO HUMAN CAPITAL

Globalization and the rapid technological advancements of the 21st century have put an unprecedented premium on an economy's ability to develop its workforce. Simply put, a more educated, highly skilled workforce leads to higher returns for all production inputs. For a place like Oklahoma to receive the benefits of high returns in an increasingly globalized world, actors across the state will need to ensure a stable production of valuable inputs and resources to support the growth of existing Oklahoma firms as well as firms that might be looking to relocate due to changes in demographics, technology, or other factors. The core to any good business is its employees, so a qualified workforce is necessary to build strong firms.

Here at the Oklahoma State University Wes Watins Center for International Trade Development (CITD), we recognize the role of workforce development as being foundational to increasing Oklahoma's competitiveness in the international market. Creating a statewide workforce that can keep up with the constantly changing trends in technology, innovation, automation, and globalization of modern businesses is no small task, so we are using this report as an opportunity to be a part of the complex and nuanced discussion surrounding Oklahoma's workforce development efforts. Also, the title of this report and the discussion that follows reflect the CITD's decision to utilize the term "human capital development" rather than "workforce development" throughout the report to center our perspective on the input element most central to a strong workforce: human beings.

The report begins with a short primer on how dynamically developed human capital relates to an economy's competitiveness. In this section, we focus on how the role of geography plays a part in forming economic clusters and creates a demand for a skilled labor pool; we also discuss the impact this demand has on an economy's efficiency and productivity. In the next section we outline the state of human capital in Oklahoma, paying attention to aspects of human capital development beyond education, which include access to health services, infrastructure, and even leisure. This section also details some of the challenges identified by the public organizations in Oklahoma who are focused on workforce development. From there, we offer some suggested solutions various entities in Oklahoma could take, with a particular focus on partnerships, that will increase Oklahoma's global competitiveness and its ability to participate successfully in global activities like international trade.

HUMAN CAPITAL AND COMPETITIVENESS

A basic principle that guides much thought around the subject of economic growth is Total Factor Productivity (TFP). The basic purpose of TFP is to measure how efficiently an economy is using inputs for production. TFP is unique in that it considers inputs which are easy to assign numerical values to, like capital, as well as those to which it is difficult to assign specific numerical values, like labor effectiveness.¹ The general understanding is this: if you increase your TFP, you will increase your productivity and propensity for economic growth. This measure is important because it can be used to inform policy makers on how to direct economic growth and identify diminishing returns more efficiently.*

This measure is typically applied to aggregate, country level data for insight on overall economic growth. Through the academic literature surrounding this subject we know a few things that are shown to have a positive effect on a country's TFP. International trade liberalization increases TFP through efficiency gains for exporting industries due to a larger production scale and increasing imports of goods for which a country produces relatively less efficiently (directing inputs to more efficient industries). A second major contributor to increasing TFP is increasing an economy's level of human capital. Human capital contributes to TFP by increasing the rate of innovation as well as refining and better facilitating the dissemination of best practices. This, in turn, creates a 'virtuous cycle' where the increase in TFP leads to an increase in competitiveness in trade and overall economic growth, which then increases the capacity to develop human capital (Figure 1).²

Given human capital's important role in economic growth, the question remains: how do we go about developing this vital resource? One might think the answer is plainly, "Better education!" However, while education does play a central role in this area, other factors such as geographic concentration of economic activity and forward planning for future demand play critical roles in sustainable development of human capital.

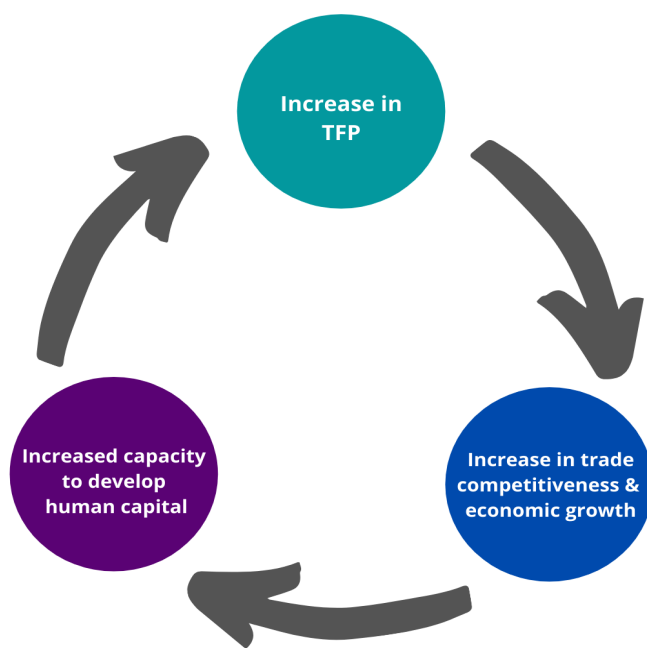


Figure 1: Virtuous Cycle for Economic Growth

HOW IS HUMAN CAPITAL DEVELOPED?

To understand human capital development at the state level, it is helpful to think about human capital development at the company level. Executive leaders continuously ask, “How can this organization be the most productive, competitive, and profitable it can be?” One commonly understood answer is for firms to invest in their employees. Many business leaders understand that to reduce turnover and increase productivity, it is important to ensure quality employees have the resources to keep up with changing industry standards. They must be able to challenge competitors with skills and technology and create new opportunities through innovation. If they are to be retained, they must be fairly compensated, be prepared to adapt to future industry and global challenges, and feel fulfilled by their lives both at and beyond work. By extending the original question to the state level, “How can Oklahoma companies be the most productive, competitive, and profitable they can be?”, we seek to better inform state stakeholders on how productivity can be increased via human capital development at the state level.

To answer this question, we turn to 2008 Nobel laureate Paul Krugman’s theoretical contributions to the understanding of geographic concentration to help visualize some of the challenges and advantages that the state of Oklahoma has when it comes to competitiveness and increasing TFP through the development of human capital. Krugman posits that firms capitalize on economic geography by forming “clusters” of companies within similar industries in the same general geographic location, which results in increasing returns for all firms in the area.³ This cycle applies to the labor pool as well by attracting and developing a highly specialized workforce, which then offers more protection from risks like unemployment and exploitation as firms offer market clearing wages to compete for labor, further attracting quality candidates into the labor force. Additionally, gains in production efficiency reduce the incentives for competing clusters to form elsewhere.

“...gains in productions efficiency **REDUCE** the **INCENTIVES FOR COMPETING** clusters to form elsewhere”



Figure 2: Oklahoma Driver and Complementary Ecosystems

A couple of well-known examples illustrate this phenomenon: Silicon Valley for technology and Nashville for music. These places have a geographic advantage that was partially random at first but has since capitalized upon the initial increasing returns through the convergence of strategies between businesses, city and state governments, policymakers, and educational institutions that facilitate the attraction, development, and retention of a dynamic labor force which meets firms’ needs to develop competitiveness.

In Oklahoma, clusters have begun to form and have been classified by the Oklahoma Department of Commerce (OK Commerce) as “ecosystems.” Two types of ecosystems have been identified: driver ecosystems which drive wealth in the economy, and complementary ecosystems, which provide critical support to the driver ecosystems, (Figure 2).⁴

OK Commerce and Oklahoma Works have taken critical steps towards measuring the outputs of these ecosystems by geographic location by also identifying the key workforce development areas in Oklahoma (Figure 3).⁵ Each region has reports which detail the ecosystems that are the most prominent and provide data on current labor productivity.

To build on efforts of workforce development professionals around the state, and further develop these existing ecosystems into vibrant clusters, key stakeholders will need to identify ways to ensure human capital needs are met at the firm level. It is also important to note that human capital is interested in more than just wages. Quality employees search for locations which offer exciting attractions and robust infrastructure that improves their quality of life.

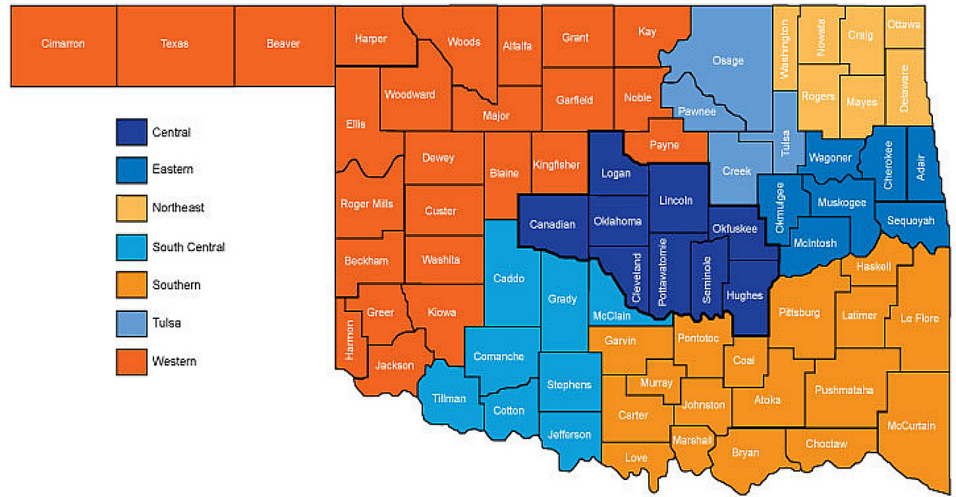


Figure 3: Oklahoma Workforce Development Areas

We have mentioned the ways in which strong human capital/workforce development can have a positive effect on both total factor productivity and overall economic growth. However, it is also important to understand how poor investment in human capital/workforce development can have a negative impact on the economy.

A concept that puts this into perspective is that of the skill equilibrium. As seen in Figure 4,⁶ labor supply and demand can lead to either surpluses or shortages which require correction. However, a potentially more perilous situation arises when both demand and supply for human capital is low. This scenario is called a low skills equilibrium (LSEq), which is associated with both low-wages and weak economic

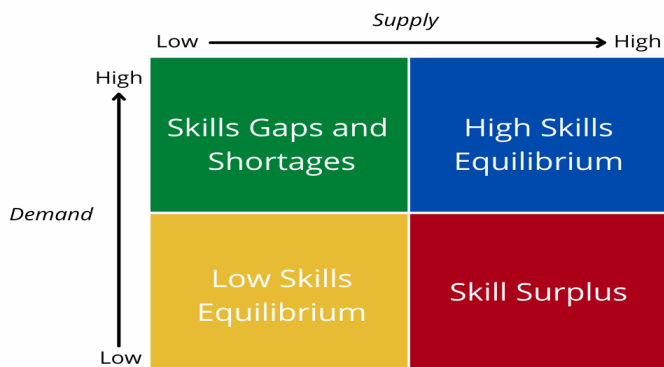


Figure 4: Moving from High to Low Skill Equilibrium

performance. The LSEq explains how in 1988, the UK landed in a vicious cycle where demand for skills was low. The problem began because firms were intent on paying low wages and the government had a policy focused on job creation rather than productivity growth and job quality. The result was low quality/low value goods and services produced by firms hiring low-skill workers and poorly trained managers.⁷ This relationship between low demand for skills and low skills

supply inhibits the development and expansion of higher value activities. Just as strong investment in human capital at the state level increases the likelihood of the aforementioned virtuous cycle (Figure 1), a

“STRONG INVESTMENT IN HUMAN CAPITAL at the state level increases the likelihood of the aforementioned VIRTUOUS CYCLE”

low skills equilibrium can cause a vicious cycle that decreases economic activity.

LSEq describes both the cause and the consequence of weak economic performance, which can be attributed to poor public education and training programs.⁸ Therefore, institutions

focused on local policy and economics, which make decisions about public education and training programs, have the power to shape potential outcomes through labor market strategies. For example, when policymakers focus on increasing the skills supply, but do not *simultaneously* work to improve the demand for these jobs, high-skilled individuals leave the area to find better job opportunities. This often causes policymakers to engage in reactive fixes where they divert resources towards filling labor shortages instead of proactively addressing skill shortages.

“a LOW SKILLS EQUILIBRIUM can CAUSE A VICIOUS CYCLE that decreases economic activity”

Thus, LSEq cannot be fully resolved through hiring more educated workers and investing in training unless firms also make changes to increase demand and improve the quality of their management, work design, and new technology implementation. Therefore, demand and supply must be improved simultaneously by both public institutions and private sector entities. According to Froy, Giguère and Meghnagi, a progression towards high-skill equilibrium will only be attained through proactive collaboration between local stakeholders to improve both the supply and demand for local jobs.⁹

These are important considerations for Oklahoma’s policymakers to keep in mind. If the state chooses to develop its human capital by recruiting and retaining more educated workers and investing in better training programs, Oklahoma firms also need to be willing to improve the quality of their overall operations as well. Furthermore, in order to progress towards a high-skills equilibrium, Oklahoma actors need to work simultaneously to improve demand for skilled labor.¹⁰ Otherwise, young, well-trained graduates of Oklahoma’s educational institutions will look elsewhere for job opportunities.

CURRENT STATE OF HUMAN CAPITAL DEVELOPMENT IN OKLAHOMA

In this section, we provide an overview of the actors currently involved in human capital development in Oklahoma, how these entities interact, and also identify strengths and weaknesses of the present system.

INTEGRAL PUBLIC ORGANIZATIONS

Below are overviews of the public resources available in Oklahoma, and their current work involving human capital development. These organizations provide excellent content and services, and this report is meant to promote and build upon their efforts by providing fresh insight.

Oklahoma Governor’s Workforce Council

The Governor’s Council for Workforce and Economic Development is a group critical to supporting the types of relationships needed to promote a virtuous cycle of economic growth in Oklahoma. The council brings together leaders from business, government, education, and non-profit sectors to create strategies to improve human capital, or workforce development in Oklahoma.¹¹

Helpful Resources:

- Workforce and Economic Development Strategic Plan¹²
- List of Council Members and Groups They Represent¹³

Oklahoma Department of Commerce (OK Commerce)

OK Commerce is the central organization for business endeavors within the state. They offer a wide array of services which aid in their mission to “bring jobs, investment, and economic prosperity to the state of Oklahoma.”

Helpful Resources:

- Workforce Ecosystem Profiles¹⁴
- Regional Economic Development Support¹⁵
- Business Expansion and Relocation Guide¹⁶

Oklahoma Works

A partially federally funded partner organization of OK Commerce, Oklahoma Works, focuses specifically on “aligning resources, education, training and job opportunities to build Oklahoma’s workforce.”¹⁷ They facilitate state initiatives that provide programs involving work-based learning, career pathways, sector partnerships, skills-based practices, career exposure week, and Oklahoma military connections.

Helpful Resources:

- OK Talent Pipeline Report¹⁸
- Information on Workforce Innovation and Opportunity Act (WIOA)¹⁹

Oklahoma CareerTech

“The Oklahoma Department of Career and Technology Education (CareerTech) provides leadership and resources and assures standards of excellence for a comprehensive statewide system of career and technology education. The system offers programs and services through 29 technology center districts operating on 58 campuses, 394 K-12 school districts, 16 Skills Centers campuses that include three juvenile facilities, and 32 Adult

Basic Education service providers.”²⁰ Oklahoma CareerTech has been instrumental to the formation of Oklahoma’s Centers for Workforce Excellence and have many resources available to guide those looking for career advice in Oklahoma.

Helpful Resources:

- CareerTech Strategic Plan²¹
- OK Career Guide: Online tool²²

Center for Workforce Excellence (CWE)

A great example of promoting collaboration among state actors towards workforce development is the creation of Oklahoma’s “Centers for Workforce Excellence.” Nine communities²³ across the state have been chosen to support one of these centers, and will collaborate on improving human capital (workforce development) strategies. A cornerstone of these strategies will be engaging diverse community stakeholders in the creation of high-skilled jobs and increasing access to vocational-training and higher education for high demand occupations identified in workforce development areas. The proper investment and implementation of these new centers will be critical to aligning Oklahoma’s human capital strategies across the state.

Helpful Resources:

- Oklahoma Centers for Workforce Excellence: Initial guidelines for Certification²⁴
- Local Area Workforce Planning Guide²⁵

Oklahoma Department of Rehabilitation Services (OK DRS)

The OK DRS works to increase opportunities for economic stability and self-sufficiency for Oklahomans with disabilities. The five OK DRS divisions (Vocational Rehabilitation, Services for the Blind and Visually Impaired, Disability Determination, Oklahoma School for the Blind, and Oklahoma School for the Deaf) help increase access to resources surrounding needs in the workplace, school, and at home.

Helpful Resources:

- Disability Resource Guide, Chapter 3: Employment²⁶

Oklahoma State Regents for Higher Education (OSRHE)

The OSRHE is a team of 9 members appointed by the governor for terms of 9 years. They are responsible for decisions surrounding the state system of public higher education institutions (25 colleges and universities – including two research universities, 10 regional universities, one public liberal arts university and 12 community colleges – and 11 constituent agencies and two university centers) in Oklahoma. Their main objectives are “determining the functions and courses of study of each institution, setting standards of education, and allocating state funds to carry out institutional functions.”²⁷

Helpful Resources:

- Regional Educational Profiles²⁸

OSRHE - Economic Development Council (OSRHE-EDC)

OSRHE-EDC is a statewide panel of economic development professionals from each institution represented by the OSRHE that “serve as an advisory council to the Chancellor, OSRHE staff, the OSRHE Council of Presidents and other state officials.”²⁹ The OSRHE-EDC also provides project assistance to the Business Location Division of the Oklahoma

Department of Commerce for the purpose of recruiting companies to Oklahoma.

Helpful Resources:

- Workforce and Economic Development Dashboard³⁰
- The Economic Role of Oklahoma’s Public Colleges and Universities report³¹
- Connect: Business Support Services³²

PREVIOUSLY IDENTIFIED CHALLENGES

Clearly, Oklahoma has many organizations contributing to efforts surrounding the development of human capital, or workforce development, and since Oklahomans always strive to improve, there have been a number of challenges identified by these different groups over time.

Within the aforementioned ecosystems, or industry clusters, Oklahoma Works has identified a list of critical occupations that are currently high in demand and should continue to have positive future growth. However, according to other information provided by Oklahoma Works, by 2028, Oklahoma will face a talent gap, with a shortage of 20,000 workers due to an aging population, low workforce participation rates, and low unemployment.³³ This macro-level estimate does not take job projections within all industries into consideration, so there could potentially be a greater shortfall due to the ripple effects of deficiencies in human capital development within and across industries. Therefore, Oklahoma might have a larger than estimated worker shortage within the next 10-15 years, due to not being able to supply Oklahoma firms with workers that are qualified for the jobs they need to fill.

Support for this argument is found at both the state and local levels in the listed critical occupations, where Oklahoma is facing a sizable skills gap—fewer residents are completing vocational training and higher education, especially in occupations with high demand such as heavy and tractor-trailer truck drivers, registered nurses, general and operations managers, maintenance and repair workers, accountants, auditors, and more.³⁴ Additionally, the state also falls behind the rest of the nation in the percentage of its workforce with an associate’s degree or higher. As discussed above, if left unchecked, lower attainment in the skills and education levels needed for individuals to succeed in Oklahoma’s critical occupations will create a vicious cycle of economic decline which, in turn, will deteriorate the education system.

“BY 2028, Oklahoma will face a TALENT GAP, with a SHORTAGE OF 20,000 WORKERS due to an aging population, low workforce participation rates, and low unemployment”

The main insight from evaluating these over-arching challenges is that while Oklahoma is home to many world-class companies, educational institutions, and resources, as a state, Oklahoma has had trouble leveraging those assets to overcome obstacles, keeping the state from reaching its full potential.

EDUCATION IS FOUNDATIONAL

Higher Education

According to US News “Best Colleges Rankings” the most popular degrees held by students that graduated from the two largest higher education institutions in Oklahoma (Oklahoma State University and the University of Oklahoma) in 2019, were in the categories of “Business, Management, Marketing, and

Related Support Services” and “Engineering.”^{35, 36} While both universities have connections all over the US, the types of companies that are typically most widely represented at career fairs are those related to the oil and gas industry, which has previously stood as the top employer in the state.

However, dynamics are beginning to change. Figure 5 shows the destinations of Oklahoma graduates that leave the state.³⁷ These numbers will only grow over time if there are not enough quality jobs being created by companies that typically hire Oklahoma talent. Another factor which might contribute to graduates who are utilizing Oklahoma’s resources and then migrating out of the state, commonly known as brain drain, is that they are less interested in working within the driver ecosystems like oil and gas.

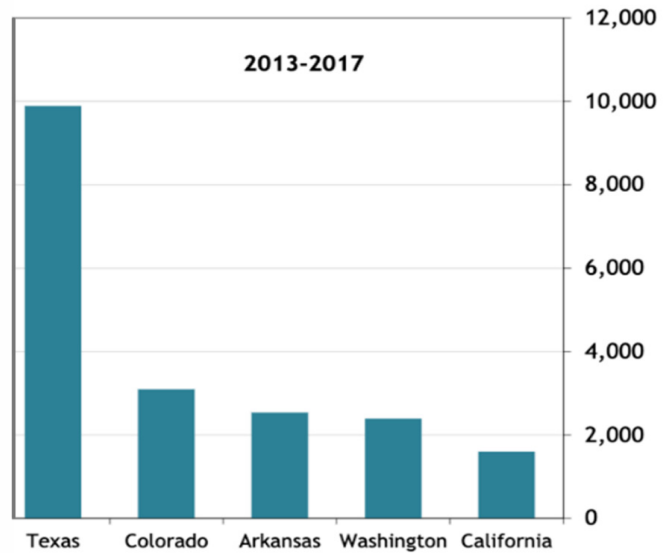


Figure 5: Where Human Capital that is Leaving Oklahoma Goes

K-12

Gaps in Oklahoma’s current K-12 educational programs signal even bigger issues for the state’s pool of human capital over the next decade and beyond and will impact the rest of Oklahoma’s foundational human capital development structures.

Time of instruction is part of the problem for Oklahoma schools. Oklahoma schools are required to hold classes for 165 days out of the year. This is a low requirement compared to national average of 180 days and it seems Oklahoma students need more instruction to catch up, not less. On average, Oklahoma schools also test lower than the national averages for both reading and math at the 4th and 8th grade levels.³⁸ Even schools that are keeping up with or exceeding Oklahoma standards on test scores are still behind nationally, and this impacts the quality of labor available to Oklahoma upon their graduation.

Major budget cuts to Oklahoma’s public education (like those implemented in 2018) force schools to lower standards for Oklahoma students and teachers in order to stay open. Some school districts shifted to 4-day school weeks in efforts to reduce constraints on district budgets. However, recent studies have shown that savings are minimal, at best. The 4-day school week has been touted to save school districts up to 20% on their overall costs. However, the actual savings have been much lower: a maximum of 5.43% and on average, most only save between 0.4% and 2.5%.³⁹ Additionally, for working parents, a 4-day school week adds a financial burden of finding child-care for one day per week, which many cannot afford.

Lastly, Oklahoma has had trouble attracting and retaining enough talented teachers. In fact, in 2016 Oklahoma’s teacher of the year left the subsequent semester to teach in Texas for better pay. This is part of a larger trend of teachers leaving the state due to low relative pay compared to adjacent states.⁴⁰ In 2018, teachers across Oklahoma, with bipartisan support across the state and country, went on strike to demand better pay and funding. While it did result in modest raises for teachers, so far it has proved to be insufficient as Oklahoma has had to extend a bill attempting to bring teachers out of retirement, delay teacher retirements to fill empty positions, and issue emergency teaching certifications to individuals who

otherwise might be neither qualified to teach nor interested in teaching.⁴¹ Combined, all of these issues point to the need for more funding, which in the long-term would pay for itself through contributions to improving Oklahoma's TFP.

Vocational Training and Tech Schools

A unique component of Oklahoma's education system is its emphasis on technical and trade schools. These institutions are designed to have shorter, more concentrated degree plans so that individuals looking to get acclimated to the workforce quickly can do so by gaining skills and practical training for specific careers without the time investment and debt load of pursuing a 4-year degree. However, these schools also face some challenges. First, while Oklahoma has 29 technology centers located on 58 campuses around the state, enrollment is likely not high enough to meet the real demand.

The average placement rate for the preceding four years, 2015-2018, was 94 percent, but the average percentage of students placed into jobs during those four years was just 40 percent. Since total enrollment rates have increased over these years (from 511,512 in 2016 to 558,169 in 2019), it stands to reason that there is a significant number of jobs out there for these graduates. With the rate of placement into actual jobs increasing from 40 to 47 percent in 2019, CareerTech has begun to capitalize on the demands of the job market in 2019. If they can attribute that percent change to specific actions, then it is reasonable to assume they can further improve upon these strategies in order to ensure that higher rates of students being placed into jobs alongside higher enrollment numbers. Pinpointing and capitalizing on these strategies will be essential to CareerTech programs bouncing back from the decreased enrollments in 2020 (455,124).⁴²

There are several ways in which low enrollment rates in vocational school programs compound with existing skill gaps to contribute to larger human capital issues. Figures 6 and 7,⁴³ gathered by EMSI and utilized in the OK Talent Pipeline Report, display the disparities between skills Oklahomans have in their online job profiles and skills Oklahoma companies require in online job postings. One way we can solve skills gaps like these is a process known as "up-skilling."

A good example of a skills shortage can be found in the medical field. Figure 6 shows a gap in hard skills necessary for essential job positions like nurses, surgeons, and pediatricians. In the case of nursing, this gap in hard skills can be attributed to two major issues. The first is a decades long shortage of programs to properly train enough nurses to meet the demand within the state.⁴⁴ Another major problem commonly seen for programs meant to up-skill healthcare workers into fully accredited nursing positions, is the related shortcomings in primary, or K-12, education. Low levels of literacy and math skills that should have been developed in primary education directly impair the

Hard Skills in Demand

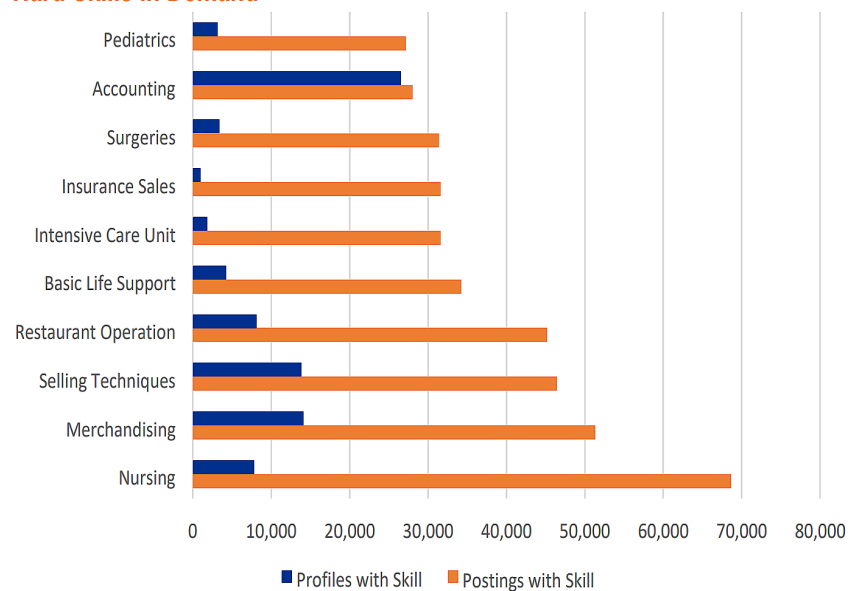


Figure 6: Hard Skills Oklahomans display in profiles vs. skills Oklahoma companies require in online job postings

ability of technical and trade schools to sufficiently train individuals that qualify for these upskilling programs. This issue will only be compounded in the coming years. Other hard skills that will continue to be in more demand over time are those related to technology and data analysis due to jobs being replaced by increased automation.

Creating a Foundation for the Future

In addition to mismatches in demand and inadequate primary education, Figure 7 shows the differences in soft skills between profiles and postings and indicates there is a major gap for soft skills such as: computer literacy, written communications, and innovation. It seems that for the past 20 years national trends have primarily focused on promoting preparedness for education and careers in STEM, but more and more employers are realizing how fundamental soft skills like those shown in the Figure 7 are to their ultimate success.

This highlights a strong need for programs that re-emphasize the development of soft skills, along with education in STEM, because both are critical to employee and organizational success. Potential partnerships between educational institutions at all levels specializing in humanities (social sciences, language, arts, history, reading and writing, global studies, etc.), and those specializing in STEM (science, technology, engineering, and mathematics) will be necessary going forward. Soft skills are also imperative to increase the state’s global competitiveness and assure that we are equipping Oklahoma companies with employees that act as global citizens and display the type of cultural competencies that will further operations in a more globalized world.

Lastly, as seen above, most foundational education programs are designed to address the current skills needs in Oklahoma. However, while filling current needs is important, it is also imperative that the organizations integral to developing human capital in Oklahoma are committing resources, research, and planning for Oklahoma industries of the future. At the CITD, we believe these projections will have to include an increase in international trade.

Soft Skills in Demand

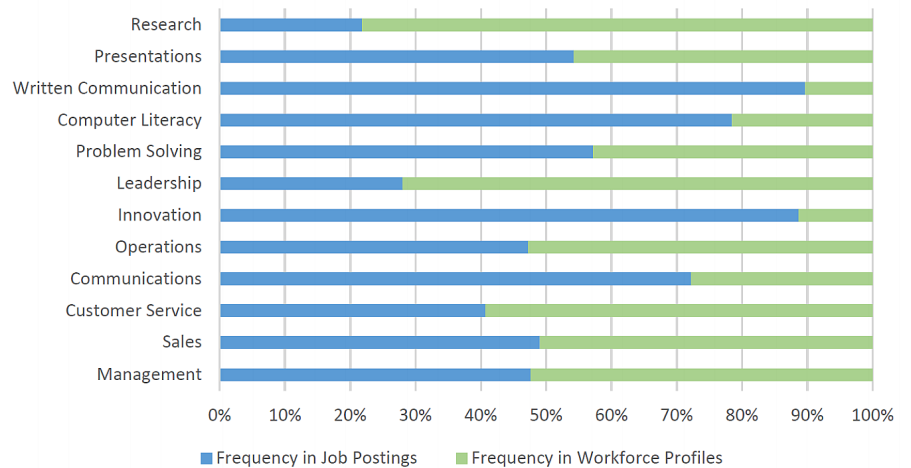


Figure 7: Soft Skills Oklahomans display in profiles vs. soft skills Oklahoma companies require in online job postings

THE HUMAN EQUATION

The previous section of this report highlights some of the issues identified within the current workforce development, or human capital development, system in Oklahoma. We have looked at inadequate funding of primary schools, large numbers of college graduates leaving the state, and gaps in hard and soft skills. If the effects of these challenges are already starting to be seen, Oklahoma may have many more problems on the horizon. Without concentrated, intentional, and coordinated efforts towards holistic solutions to these challenges, these issues will only worsen over time.

One of the more significant complications facing Oklahoma right now is the issue of brain drain, as mentioned in the “Higher Education” portion of the “Education is Foundational” section (page 13). This is a problem faced by much of the Midwest and the South and refers to the trend of qualified talent utilizing the education system in their home state and then seeking opportunities outside of the state after graduation. There are two basic ways to stay globally competitive and combat the labor-shortage causing phenomena of brain drain: retention and attraction. Below, we discuss how retention and attraction strategies often tend to focus on cost savings at the firm-level, which can neglect other inputs needed for labor.

RETENTION AND ATTRACTION OF BUSINESS

Retention efforts aim to retain qualified talent or utilize educational programs within the state to help workers “upskill” so they can fill needs in critically needed occupations. Attraction efforts seek to bring new, non-local talent to Oklahoma through various means. This can be done on an individual basis like the ‘Remote Tulsa’⁴⁵ program run by the George Kaiser Family Foundation, or on a firm-level basis where cities enter bids with companies looking to open new locations—like Tulsa’s recent bid to persuade Tesla to build a new plant there.⁴⁶ While company-level attraction efforts do have the potential to create direct impact on individuals in Oklahoma by creating high quality, well-paying jobs that both attract and retain skilled labor, one of the most common attraction tools used within the state of Oklahoma is tax incentives.

Besides tax incentives, the other main selling points Oklahoma cities tend to include in company bids are the low-cost of living, the low-cost of transportation to major cities due to Oklahoma’s central location within the US, the low cost of energy, and a cost-effective workforce. These factors are important to any business deciding where to locate, but they have a strong focus on a firm’s near-term bottom-line; they also neglect the current and future issues already identified in this report surrounding the topic of human capital development. While the bottom-line and profit margin of any company is vitally important, it may not be sufficient for creating dynamic, competitiveness-enhancing investment in the state.

For instance, a focus on short-term, cost-saving strategies to entice companies to place at least some of their value chain in Oklahoma creates a double-edged sword of new investment with low commitment to individual Oklahoma communities attempting to reach economies of scale and stay globally competitive. This could lead to unintended consequences related to the development of the state’s total factor productivity (TFP), impacting the skills equilibrium and ultimately the state’s overall global competitiveness. An example of this is Oklahoma’s low cost of transportation, which is frequently highlighted in proposals to attract new firms to the state. Despite low transportation costs, many of the top industries in Oklahoma (pork, wheat, oil refineries etc.) only create a fraction of the wealth for Oklahoma that they do for neighboring states. Ironically, this could be due to the fact that

economic literature has shown low transportation costs can actually have a de-concentration effect.⁴⁷ So a factor Oklahoma has historically thought of as a strength, could hinder positive, long-term economic competitiveness outcomes. If transportation costs are low enough, industries can afford to establish production facilities in alternative sites that offer more advantageous conditions in other ways, even if the goods produced will then have to be transported to the markets where they will be consumed. Rather than being headquartered in Oklahoma, companies might locate their headquarters in Texas or surrounding states and run production facilities in Oklahoma. This is what appears to have happened to Oklahoma's pork industry, among others.⁴⁸

Missing out on this critical part of the value chain has major implications for long-term, statewide development. While production facilities can provide a strong proportion of good jobs, headquarters have the careers that high-skilled talent from Oklahoma currently leave the state to find (accountants, data analysts, marketing and communications professionals, information technology, administrative positions, etc.), thus preventing Oklahoma from reaping the benefits of the aforementioned virtuous cycle which contributes so substantially to global competitiveness.

QUALITY OF LIFE CONSIDERATIONS: WHAT MATTERS TO HUMANS?

The “bottom-line” business decisions of companies can be an extremely important tool of persuasion. However, companies and organizations are built by people with individual lifestyle choices, who are free to move both within and outside of the US. Therefore, firm locations matter, not only to the bottom line, but to the individuals that make up successful companies.

In order for Oklahoma to increase its overall global competitiveness, we will need to be looking at future industry needs as well as future social, policy, and infrastructure needs. If Oklahoma wants to attract a workforce that will successfully fill some of the skills gaps mentioned in the “Education is Foundational” section, that means attracting talented professionals of the Millennial and Gen Z demographics and planning for the Alpha and Beta Generations as well. These younger groups of Americans are on average educated at a higher rate than previous generations and are racially, ethnically, and politically diverse.⁴⁹

The PEW Research Center released a report on the determinants of how Americans find life satisfaction and happiness. They identify four categories which include determinants; good health, presence of a romantic partner or spouse, presence of friends, and career.⁵⁰ The benefits of a low-cost of living and low transportation costs will reach individual employees of companies located in Oklahoma to some extent and may contribute to some of these determinants. However, many other factors are necessary to create positive determinants of happiness for the present, and future, diverse generations that will carry our state forward.

If firms need to be located where employees will be most productive, and the most productive employees are those that are satisfied with the life they are able to provide for themselves and their families, then it is imperative that states like Oklahoma are creating an environment hospitable to the inputs we will rely on to fulfill our current and future needs: qualified human capital. Many of these factors will need to be addressed through state-wide public policy changes to engineer action to strengthen the foundation for ongoing human capital development. Bolstering Oklahoma's competitive position in an increasingly globalized environment, demands improving K-12 education, increasing teacher compensation, and re-thinking competitive tax structures to fund these improvements.

INVESTING IN OKLAHOMA'S FUTURE THROUGH HUMAN CAPITAL DEVELOPMENT

Oklahoma industries want to reap the benefits of higher total factor productivity and the virtuous cycle of economic development that comes from developing dynamic competitive clusters. In order to achieve these lofty goals, there will need to be concentrated, joint action by leaders of business, policy, and education within the state. It is important that these entities create solutions so communities across Oklahoma are poised with the resources to help companies keep up with changing industry standards, challenge competitors with skills and technology, create new opportunities through innovation, fairly compensate and attract talented labor, prepare for future industry challenges within the global workplace, and satisfy their employees lives inside and outside of work.

Throughout this report we have referenced some of the previously identified challenges regarding human capital development in Oklahoma. In this final section, we apply the lens of global competitiveness to identify some of the additional future trends we see as obstacles for Oklahoma's development, provide targeted solutions which Oklahoma's business, policy, and education leaders might utilize to tackle these challenges and obstacles.

CHALLENGE 1: AUTOMATION DOES NOT ALWAYS CREATE OPPORTUNITY

We mentioned automation at the tail end of the "Education is Foundational" section, but our analysis is only a start. Automation will have such a large and disruptive impact on employment dynamics that the subject deserves its own report. The concept of automation is generally presented as a positive for the economy because machines can perform manufacturing and other repetitive (and now, with machine learning and other artificial intelligence tools, cognitive) tasks more efficiently. The logic follows that automated productivity frees up more time and money for humans to utilize towards further progress, innovation, and uniquely human tasks. So, hypothetically, this means automation is pushing out repetitive and low-skill jobs, while creating some higher skilled jobs that are currently rare (or do not yet exist). Furthermore, if consumption of goods increases as competitiveness increases, abroad or domestically, demand could conceivably offset the initial job losses as firms hire to meet new demand.

However, historically, the realities of automation are detrimental, at least in the short term, to individuals that once performed newly automated tasks, and to communities that have been reliant on economic activity from jobs that now belong to machines. Retraining labor to obtain skills needed to move into a more technologically advanced position is quite difficult, and the resulting unemployment can be an enormous burden on social safety net structures, which are already under-funded in states like Oklahoma.

Challenge insight:

For humans to transition to what are seen as more "dynamic" jobs that are typically higher-paying and more technologically advanced, they will have to develop new skills. Additionally, if companies do not want to be caught off guard by innovations in automation, it is imperative that industry leaders stay aware of changes within their industry and how that might affect their current workforce dynamics. Lastly, one dynamic that is understood about post-automation workflows, is that the demand for service sectors grows as other sectors are automated. Services are already the main contributor to Gross Domestic Product (GDP) in developed nations, and this trend will continue and likely accelerate. In Oklahoma,

the value of service exports grew five times faster than the export of goods between 2006 and 2016. Growth during this period amounted to an impressive 58%, compared to an 11% growth in the export of goods. In 2016, service exports reached \$4 billion dollars, only \$1.2 billion less than the value of goods exported during that year. In 2018, the service sector alone was responsible for about 72% of Oklahoma's GDP.⁵¹ Services with export growth potential in the state of Oklahoma include business and financial services, e-commerce, travel services, engineering, architecture/design, technology troubleshooting, and telecommunications. Therefore, Oklahoma needs to be focused on developing human capital for the service sector as well.

Solution 1: *Encourage organic talent development and formulate "exit strategies" for employees whose jobs and livelihoods will be affected by increased automation that will flow into service sector related jobs.*

Audience: *Government and Business Sector*

Automation has the potential to increase a company's efficiency and productivity, but with that comes the caveat that the job security of manufacturing workers is increasingly threatened. However, increased automation is a foreseeable change especially within large corporations, since automation typically extends from research and development expenditures. Theoretically, businesses should be able to prepare for coming changes from the bottom up--which means increasing company-level and individual employee preparation strategies.

If you are a successful business leader who has dealt with the intricacies of obtaining funds from investors, a key component of any presentation to important stakeholders is a company's "exit strategy." When asking people to invest in your business, it is imperative that you can explain how they will receive return on their investment and how you will manage difficult business decisions. In the modern business world, dealing with automation and adjusting to changes in workplace dynamics at the employee level will be an indicator of company success and sustainability. Change does not happen in a vacuum and corporate entities have a responsibility to the communities and people that serve them to invest in long-term, sustainable, workforce planning surrounding the subject of automation.

Formulating an "exit strategy" or redeployment strategy for employees that will lose jobs to automation will lessen strain on public resources from increased unemployment rates. While unemployment structures exist for a reason, and should be taken advantage of when needed, the use of these emergency measures does not help people that are out of work if the jobs for which they have experience and skills no longer exist. Slowly phasing employees into training programs that stray away from manufacturing positions, and towards service-related positions within the same industry, can create the foundation for a continually invested workforce. This could also act as a potential opening to new partnerships and mergers with other institutions.

Additionally, this solution could be part of a larger push by city and state level leaders to further aid in increasing Oklahoma's global competitiveness by investing time, efforts, and research towards organic talent development measures which will lead to systems which create more holistic, diverse, and adaptive human capital. A key component of this strategy will be to clearly define future work needs and skills which will be necessary to the growth of key industries.

CHALLENGE 2: FUTURE SKILL DEMANDS ARE MORE THAN STEM

With the advent of powerful technology and improved efficacy of scientific processes many academic institutions have pushed STEM education and demanded proficiencies in hard skills. While hard skills are necessary for many job paths, much of the advancement of hard skills in the educational world has come at the cost of developing the skills commonly found in humanities and liberal arts education, and funding for these programs is almost always the first to be cut in smaller, publicly funded, schools. However, with machines becoming more adept and technology advances that can make the process of data analysis much more accessible, tasks once limited to those with STEM majors will soon be a more inclusive process.⁵² Furthermore, the critical thinking and soft skills learned in the social sciences and liberal arts will be needed to understand how to apply the findings from data analysis.

Challenge Insight:

In order to comprehensively address the complex issues companies will continue to face far into the future, it is necessary to cultivate talent that can do the things that machines will never be able to do, like critical thinking, creative problem solving, communication, understanding human dynamics, etc. For firms that engage in international trade this is especially true because for business entities to expand to new global markets and provide those markets with a comparable level of service that US customers receive, they will need to employ individuals that are culturally competent, understand trade networks, and can communicate effectively with actors around the world.

Solution 2: *Develop partnerships between educational / training institutions to develop apprenticeships or other mechanisms which aim to fill the future gaps in the talent pipeline.*

Audience: *Business and Education*

Business leaders will need to take an active role in identifying the future needs of their companies in terms of human capital. While it is difficult to focus on the future if there are current gaps between available workforce and the skills needed, failure to do so will put Oklahoma at risk of falling into the low skills equilibrium (LSEq) trap discussed above.

Apprenticeships are a great way to fill those gaps. For students interested in learning certain skillsets, and who are looking to enter the workforce directly after high school, a direct path into a company that can help with the training of those specific skillsets serves as a strong incentive. Furthermore, when this occurs in an environment where students do not have to pay for extra education, and are learning skills that are applicable to critically needed occupations, it is beneficial for the student, the employer, and the broader economy. Along these lines, the Oklahoma Office of Workforce Development (OOWD) has developed three apprenticeship grants for which employers can apply.⁵³

Additionally, Oklahoma's State legislature has been debating Senate Bill 619,⁵⁴ which will allow for this exact type of relationship between educational institutions and private sector companies. Utilizing this new legislation, and getting students and companies involved will certainly be an undertaking. But committing funds and resources to building a solid foundation for this system will be imperative to future of human capital development in Oklahoma. This bill has received bipartisan support, and after being amended by both the Senate and House was sent on April 29, 2021 to the Governor's desk for his signature.⁵⁵

CHALLENGE 3: BRAIN DRAIN IS A SHORT-TERM AND LONG-TERM PROBLEM

Developing an economy that attracts and retains locally produced talent will require long-term investment. We've shown that problems for Oklahoma begin in primary school, however, Oklahoma businesses are also being hurt by brain drain* now and the damage needs to be mitigated before it snowballs further.

A related problem is that many international students seek opportunities to continue their contribution to the US economy after they graduate from higher education institutions but are unable to because of visa limitations. This is a problem for two reasons. First, if fewer students are able to stay, fewer will come. As a result, the US will miss out on substantial economic benefit, including tuition, as international students pay out of state rates, and the related economic activity generated by international students.⁵⁶ Second, at the graduate level, US institutions rely on international students for research productivity, which is one of the most critical avenues for universities to gain funding, and these universities use public funds to invest in educating some of the brightest students from around the world in technical fields that domestic students are unlikely to study. This is a major loss of potential as it does not properly leverage the US ability to attract talent worldwide.

Solution 3: *Employ higher rates of international students graduating from Oklahoma's colleges and universities with advanced degrees in needed fields to address short-term skill shortfalls.*

Audience: *Business, Education, and Government*

While current programs are working to address issues surrounding primary education capacity in Oklahoma, it will be important for city and state level entities to work with education institutions and private sector entities to promote greater utilization of international students within the workforce as part of Oklahoma's long-term human capital development plan. Currently, after graduating with degrees from Oklahoma's universities, 40% of all graduates seek opportunities elsewhere within five years.⁵⁷ A key demographic involved in this brain drain statistic that companies might not be focused on are international students who are more likely to go wherever they are given an opportunity as work visas are quite difficult to obtain.

The percentage of doctorate seeking international students who intend to stay in the US after graduation has increased from 55% in 1996 to 75% in 2015.⁵⁸ The Oklahoma workforce could benefit from hiring more international students according to a study by the National Bureau of Economic research (NBER). The study found that if companies employ foreign high-skilled labor, they are more likely to hire more overall domestic and foreign high-skilled workers, leading to a larger, highly-skilled workforce within the firm.⁵⁹ These students stand to act as dynamic, well-educated, multi-cultural additions to any workforce seeking to move to a more globally competitive position. However, for this solution to work, it will need active cooperation not only between educational institutions and businesses, but also government, to allow these students immigration statuses to stay and work.

CHALLENGE 4: WE ARE ALL STAKEHOLDERS IN OK'S HUMAN CAPITAL

For Oklahoma to remain competitive in the ever-changing global market, there will need to be more integration of strategies between disparate actors (e.g. business leaders, educational institutions, city and state-level government entities throughout the state). It may seem counter-intuitive, but the best

* as mentioned in the "Higher Education" portion of the "Education is Foundational" section

Investing In Oklahoma’s Future Through Human Capital Development

way to create systems-level, or in this case, state-level change is to meaningfully engage grass-roots actors initiating change in their individual communities.

Challenge Insight:

Oklahoma possesses an ease of doing business, commitment to ingenuity, and large research universities that make it a great place for start-up communities to thrive. There are pockets of start-up and entrepreneurial scenes around Oklahoma, however, they are rather disjointed and do not operate within a cohesive statewide framework. Creating opportunities for these actors to work together and create a hub of economic activity throughout the state could be a worthwhile investment. The people that are already solving problems in Oklahoma are those most likely to be invested in making Oklahoma communities stronger. Therefore, Oklahoma leaders need to increase access to resources for local companies looking to expand, in addition to encouraging new entrepreneurial pursuits around the state. These steps can be an effective way to show investment in the people and companies that are already here and contributing to Oklahoma’s economy.

Solution 4: *Introduce a “Grow Your Own” or “Ecosystem Approach” to Statewide Entrepreneurial Endeavors*

Audience: *Government and Business*

The Kauffman Foundation, a non-profit based out of Kansas City, Missouri, has coined the term “entrepreneurial ecosystems”⁶⁰ which seeks to bring a new level of understanding to the traditional term of economic development, by including actors who are typically left out of traditional systems of large, enterprise-level investment. Sometimes, the “ecosystem” is already there, it just needs concentrated efforts from individuals (ecosystem builders) to facilitate greater connection between the (often) disparate actors within an existing ecosystem.

The actors within an entrepreneurial ecosystem can look like traditional, government-run, economic development institutions like Small Business Development Centers, Departments of Commerce, and Chambers of Commerce. They can also look like start-up incubators (both for-profit and non-profit), community action groups, university entrepreneurial programs, food co-ops, lending institutions, policy think tanks, private enterprise projects, neighborhood development programs, and much more. Increasing platforms for positive interaction, communication, and engagement between the many types of organizations and people that are attempting to make their communities and Oklahoma better, has the potential to create innovation and community involvement in economic development throughout the state.

Lastly, greater systems-level communication between diverse entities involved in economic or community development could provide an avenue to engage with people who sought opportunities outside of Oklahoma in the past, but are looking to settle down, start their own business, or expand their existing business. These types of leads for attracting individual talent or company level investment would be extremely beneficial in re-connecting the state those individuals that already understand the positioning of Oklahoma and, most likely, have a passion for Oklahoma communities.

CONCLUSION

In this report we have provided an overview of the relationship between human capital development and global competitiveness and raised several discussion topics to address human capital related challenges in Oklahoma. First, human capital is a resource that can be developed beyond just focusing on education. Investing in employee training, development and wellbeing are strategies that companies and communities can use to improve productivity, profit, and competitiveness. Second, anticipating future needs and planning for future demand play critical roles in sustainable growth. Third, Oklahoma's stakeholders will need to work strategically and in partnership not only to meet current workforce demand but also future demand. Applying these strategies at a state-level, while being cognizant of concepts such as Total Factor Productivity, Low Skills Equilibrium, and industry cluster development, can ensure a more productive, profitable, and globally competitive state.

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