

Drivers of Change in Higher Education: Demographics and Technology



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Executive Summary

This report provides a survey two drivers of change in higher education – demographics and technology - which will impact institutions over the next ten years, as well as a set of recommendations and next steps for the NC System to consider helping its campuses stay relevant and successful in the changing higher education landscape. For this report, we are defining success using two aspects of *Higher Expectations*, the NC System Strategic Plan. These two aspects are:

- Access: The UNC system must continue its proud heritage of access and student diversity.
- Student success: Increase degree attainment and ensure value and relevance for students.¹

Method

Our research included in-person interviews, books, and numerous online articles and videos.

Findings

The following is a summary of the technological and demographic changes we believe will impact higher education in the next ten years:

- We expect that demand for higher education among non-traditional students will increase while the traditional student population will become more diverse and slightly decline in all but the largest metropolitan cities and their surrounding areas.
- Many higher education seekers will want something other than a four-year degree and will want to demonstrate competencies to employers.
- The generation of younger students, called iGen, experience significant mental health challenges and require more support to thrive.
- iGen students are avid users of social media and process information more visually
- Older and first-generation students experience barriers to entry, such as distributed services and little or no experience with the higher education system processes
- Automation is increasing, which means many workers will need to be re-skilled in the next decade in order to transition into jobs that cannot be automated. These older workers often have families and jobs and cannot stop their lives to attend school full-time.
- Companies want employees to demonstrate competencies and quickly re-skill

Recommendations

Each recommendation comes with a set of next steps for the 17 campus provosts and NC System administrators to consider. The full report describes the factors that go into each of the recommendations.

1. Expand access to High Impact Practices (HIP)s
2. Expand access to mental health support;
3. Create student success hubs;
4. Expand certificate programs, credentialing, and digital badging;
5. Expand and coordinate of online offerings;

6. Partner with local businesses, community colleges, and extension offices to provide local and in-person opportunities; and
7. Investigate, pilot and use adaptive learning systems.

Next steps for each recommendation are as follows:

1. Expand access to High Impact Practices (HIP)s

Institutions can increase student access to High Impact Practices (HIPs) and improve the quality of existing activities. This can be accomplished in the following manner:

- Department faculty may identify HIPs already used in their programs. They may include research with a faculty member, internships, service learning, study abroad, learning communities, capstone experiences, and other activities.
- Department faculty should attempt to ensure that each of their graduates will have had access to at least two HIPs during their time in the major. This may be accomplished by embedding a HIP in two required upper-division courses.
- Department faculty may use George Kuh's rubric for quality HIPs, to ensure that they stimulate students' intellectual and personal engagement.
- The institution may choose to increase access to learning communities and service learning for freshmen and sophomores, to improve retention rates.

2. Expand access to mental health support

Students may benefit from greater access to mental health resources and supportive spaces on campus that help relieve stress. This may be accomplished in the following manner:

- Campus mental health services may arrange flexible hours for counselors to facilitate sessions (by phone, online, etc.) after normal school hours. This may help students who are in crisis during evening hours when campus counseling centers are often closed.
- Providing access to counseling online may help students in remote locations, such as distance learners.
- Departmental units should invite campus mental health personnel to a faculty or staff meeting to educate them about mental health issues and indicators.
- Institutions may collaborate with their Student Government Organizations to identify and designate a space on campus for meditation, yoga, or stress-relieving sessions.
- Campus representatives may contact local organizations that provide access to therapy animals, meditation, yoga, or other stress-relieving activities.
- Faculty may choose to add contact information for campus mental health services on their syllabi. Faculty and staff may place posters advertising campus mental health services on their office doors.

3. Create student success hubs

- Examine statistics (pros/cons) on the Florence Hub and establish best practices for a dedicated success hub, based on the needs of the campus
- Consult representatives from the applicable offices for that campus to determine best usage of resources

- Examine existing space on each campus that could house a dedicated hub

4. Expand certificate programs, credentialing, and digital badging

Understand that technological displacement will lead to an increased demand for retraining and education. However, many workers will not initially be looking for a four-year degree, but for a shorter duration education in order to quickly transition to more cognitive and creative work.

- Promote certificate programs
- Pursue digital badges that can be verified and posted on social networks

5. Expand and coordinate of online offerings

Expanding and coordinating online offerings requires a coordinated NC System-level effort, as well as coordinated efforts within individual institutions.

Task forces should be formed within institutions charged with:

- conducting Strengths, Weaknesses, Opportunities, and Threats (SWOT) analyses of current online offerings,
- proposing potential ways to improve coordination, communication, and efficiencies, and
- sharing results with a larger system-wide task force.

A NC System-wide task force that coordinates with the NC System Digital Learning Initiative team should be formed, charged with:

- evaluating SWOT analyses from the 17 system institutions
- evaluating results from institutional task forces and market research from consultants, and
- proposing approaches and recommendations to the 17 institutions for a more coordinated, competitive online education strategy that benefits the entire NC System office, and
- developing a strategic plan and strategy to generate buy-in and success.

6. Partner with local businesses, community colleges, and extension offices to provide local and in-person opportunities

Form a task force at the NC System Level with a charge to:

- Develop a set of needs for supporting students with local partnerships, which can be used to identify appropriate partners
- Identify and describe opportunities in online programs that 1. Already require students to come to campus and 2. Would find benefit in having in-person learning opportunities for students.
- Identify businesses that may be interested in partnering with universities to provide local learner support through physical space, technological infrastructure, or lab access
- Conduct an analysis of current NC System & NC Community College integrations, as well as the current NC System and Cooperative Extension integrations for online offerings

- Evaluate the physical spaces and technological infrastructures in cooperative extension offices and community colleges for service proposed distance education enrollments from each county
- Investigate local partnerships in other state systems to determine which structures are most successful
- Develop a report for each NC System institution that describes a structure for potential local opportunities for online degree students in North Carolina

7. Investigate, pilot and use adaptive learning systems

Form a task force to evaluate and make recommendations for a 5-year plan for implementing adaptive learning at the UNC system

- Investigate the state of adaptive learning
- Assess needs, based on technology and demographic influences in 2028
- Identify infrastructure and process roadblocks
- Evaluate systems for integration with Learning Management Systems and other data systems on-campus
- Build and run a pilot program, with established metrics and analytics, and selected vendor
- Evaluate pilot to generate recommendations for adaption/wider implementation

Background

The following question was posed to our ULEAD team:

Universities are considered to be significant contributors to social good, but the internal and external demands placed on universities have changed over the past decade, notably in funding models and technological advances. Looking at the next decade, what changes in higher education are likely to increase? What strategic choices do universities need to consider in order to remain relevant in the future?

Our strategy to addressing this question was to draw on our respective knowledge across domains identifying the most impactful changes to society for the 2020s and determining in what ways higher education for the seventeen campuses would be impacted. Our backgrounds led us to identify demographic shifts and technological advancements as key drivers of change in the United States. We acknowledge there is uncertainty associated with these two drivers, especially regarding technology adoption. However, it is our belief that these specific drivers will have a significant impact upon higher education in even conservative scenarios. In this report we lay out seven recommendations we believe will help the seventeen campuses thrive in this future environment.



Introduction

The environment in which higher education operates is changing at an unprecedented pace; higher education must adapt and change in order to stay relevant and prepare students for success. Identifying and addressing these drivers of change will ensure that the seventeen campuses of the University of North Carolina remain relevant to students, business, government, and industry while pursuing our mission to discover, transmit, and apply knowledge to address the needs of individuals and society through instruction, research, and public service. It is our belief that shifting demographics will alter the makeup of student bodies and that technological advances will both alter the makeup of student bodies and lead to an increased demand for learning.

Demographic trends during the coming years will impact the state and national population. Their changing composition, academic needs, and geographic location will require institutions of higher education to adapt their recruiting efforts, curriculum, and campus services. Our institutions are working in an environment in which enrollment of traditional students will decrease in the middle of the next decade.¹ These traditional students will be coming from iGen, which learns and processes information more visually and in a different way than universities have traditionally delivered learning experiences.² In addition to this, there will be a greater need for higher education in rural areas, which have historically had limited access to the UNC system because of location, time constraints, and financial constraints. In tandem with these demographic changes, technological changes allow the opportunity for people to interact with educational content outside the traditional classroom and to present and develop information in ways that better align with the expectations, preferences, and styles of iGen learners.³

Incorporating information about dynamic state and national trends in demographics and technology will help institutions within the University of North Carolina System adapt to student needs and achieve the goals of its 2017-2022 Strategic Plan: access, affordability and efficiency, student success, economic impact and community engagement, excellent and diverse institutions.⁴ The research and recommendations presented in this report are specifically relevant to the goals of increasing access and student success.

Just as the information age brought significant changes to higher education so shall the next age. It is our belief that we are in the early stages of a new era, largely driven by technological advances, the ubiquity of computer networks, and the coupling of physical systems with these computer networks. Machines will begin to automate repetitive and routine tasks, even tasks we once thought of as requiring human intelligence. Although this will bring economic gains, it will also bring disruption to the workforce. There will be an increased demand placed on the educational systems as workers begin to perform more cognitive work or move into different industries. This will create a significant opportunity

¹ Grawe, N. (2018). *Demographics and the Demand for Higher Education*. Baltimore: John Hopkins University Press.

² Twenge, J. M. (2017). *iGen: Why today's super-connected kids are growing up less rebellious, more tolerant, less happy-- and completely unprepared for adulthood (and what this means for the rest of us)* (First Atria Books hardcover edition.). New York, NY: Atria Books.

³ Aoun, J. (2017). *Robot Proof: Higher Education in the Age of Automation*. Cambridge, MA: MIT Press

⁴ University of North Carolina System Strategic Planning website. Retrieved from <https://www.northcarolina.edu/strategic-planning>

for higher education. However, if higher education does not focus on these non-traditional learners, we believe private industry will. If this occurs, the education landscape will become much less competitive.

During the coming decade, the changes in demographics and technology will result in a diverse population of prospective students who will need: expanded mental health services, an engaging and adaptive curriculum that can meet the needs of both traditional and non-traditional students, and practices that reduce barriers and focus on student success. Institutions of higher education must adapt in order to meet the educational and technological needs of a rapidly changing population and business.

Demographics

Demographics will be one of the major drivers of change in higher education in the coming years, requiring outreach to a diverse population and curricular offerings that will meet the needs of students and a dynamic economy. The projected changes in North Carolina are a microcosm of national trends, as the population becomes more diverse and older. This raises a need for academic support for students with differing levels of preparation.

During the Great Recession, many people chose to delay starting a family, resulting in a lower birth rate. The national fertility rate fell by more than twelve percent since 2007. In 2026, this smaller population of children will become first-time freshmen, which could increase competition for enrollment among institutions. Only two cities east of the Mississippi River are projected to show growth in high school graduates: Atlanta, Georgia and Charlotte, North Carolina.⁵ Although the projected decrease in 18-year-olds in North Carolina is small (3%, estimated from Figure 1), approximately 44% of high school graduates in 2015 enrolled in UNC System institutions or NC Community Colleges.⁶ Institutions of higher learning will need to compete for a smaller number of students, many of whom may pursue other options after high school graduation.

North Carolina Population by Age

Ages	July 2023	July 2024	July 2025	July 2026	July 2027	July 2028	July 2029
15	139,714	137,989	136,537	134,707	133,744	133,285	134,145
16	141,852	141,214	139,488	138,062	136,256	135,337	134,898
17	140,921	142,717	142,105	140,394	138,983	137,218	136,291
18	150,425	152,722	154,563	153,943	152,238	150,853	149,119

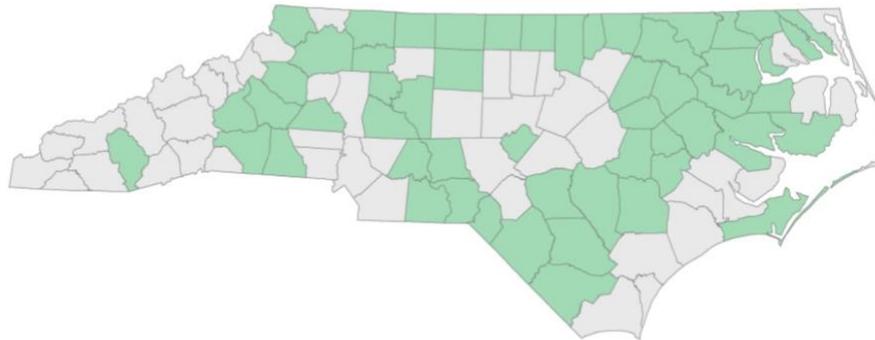
⁵ Grawe, N. (2018). *Demographics and the Demand for Higher Education*. Baltimore: John Hopkins University Press.

⁶ Tippet, R. (2018, April 14). Obstacles & Opportunities for Educational Attainment in NC. Retrieved from <https://demography.cpc.unc.edu/2018/04/12/obstacles-opportunities-for-educational-attainment-in-nc/>

Figure 1. NC Budget and Management. (n.d.). State Demographer. NC OSBM. Retrieved from <https://www.osbm.nc.gov/facts-figures/demographics>

Although the child population in North Carolina is expected to grow by 152,000 between 2015 and 2035, many will be concentrated in large metropolitan areas. Fifty-four counties in the state are projected to have declining child populations between 2015 and 2035, as shown in Figure 2 in green. Institutions of higher education may need to adjust their recruitment efforts to reach target populations.

54 NC counties projected to have declining child populations, 2015-2035



Data Source: NC OSBM Single Year of Age Projections



Figure 2. Population Loss & Shifting Age Composition, 2015-2035. Tippett, R. (2016, February 18). Retrieved from <https://demography.cpc.unc.edu/2016/02/18/population-loss-shifting-age-composition-2015-2035/>

During the next five to ten years, the percentage of public-school students from minority backgrounds in the state will increase steadily. In 2017, 44% of public-school students in North Carolina were black, Hispanic, or American Indian. This group has grown twice as fast as the overall student population and is projected to grow steadily during the next five to ten years.⁷ This has implications for higher education because these students are:

- Less likely to report plans to continue education after high school. Most Hispanic (70%), American Indian (80%), and black (81%) students plan to go to college. However, they are more likely than their white and Asian peers to report plans to enlist in the military or start employment.
- Less likely to enroll at UNC System institutions or NC Community Colleges (Hispanic 34%, black 33%).
- Less likely to complete a college degree. In 2015, 14% of all young adults 18-24 reported holding an associate degree or higher. American Indian (4%), black (7%), and Hispanic (7%) young adults reported degree completion rates below the state average.

⁷ Tippett, R. (2018, April 14). Obstacles & Opportunities for Educational Attainment in NC. Retrieved from <https://demography.cpc.unc.edu/2018/04/12/obstacles-opportunities-for-educational-attainment-in-nc/>

- More likely to be first-generation college students (Hispanic 89%, black 64%, American Indian 60%). Asian (36%) and white (37%) students are less likely to live in a household where no adult has a college degree.⁸

Institutions will need to increase their recruitment efforts to students from minority and underserved populations (first-generation college students, Pell Grant-eligible, rural, etc.). In addition, the difference in students' academic preparation may require greater investment in academic support. Research suggests that academic support is one of the best options for institutions to improve retention and graduation rates.⁹

A significant portion of the national population are identified by author Jean Twenge as iGen, the generation born between 1995 and 2012. There are seventy-four million Americans among this group, comprising approximately 24% of the population. They are the most ethnically diverse generation in American history, with approximately 25% identifying as Hispanic, and almost 5 percent as multiracial. Non-Hispanic whites constitute the majority, at 53%.¹⁰ iGen already constitutes the majority of current traditional-age college students and recent graduates. Their elevated use of social media has implications for the way they learn and their mental health.

As digital natives, iGen students show a preference for visual texts (images, video content, etc.) and read fewer books than previous generations.¹¹ This suggests a need for academic support and engaging instructional content. Instructors should vary the modes of delivery and strengthen students' ability to discern credible sources. However, the greatest concern for institutions serving this population may be their mental health.

Jean Twenge, author of *iGen*, reports research indicating a rise in loneliness, depressive symptoms, major depressive episodes, anxiety, self-injury, and suicide among this population since 2011. This is consistent with research showing connections between these depressive symptoms and use of social media and electronic devices. The American Collegiate Health Association and American Freshman Survey show rising trends in depression and anxiety among college students.¹²

⁸ Tippett, R. (2018, April 14). Obstacles & Opportunities for Educational Attainment in NC. Retrieved from <https://demography.cpc.unc.edu/2018/04/12/obstacles-opportunities-for-educational-attainment-in-nc/>

⁹ Habley, W. R., Bloom, J. L., & Robbins, S. (2012). *Increasing Persistence*. San Francisco, CA: Jossey-Bass.

¹⁰ Twenge, J. M. (2017). *iGen: Why today's super-connected kids are growing up less rebellious, more tolerant, less happy-- and completely unprepared for adulthood (and what this means for the rest of us)* (First Atria Books hardcover edition.). New York, NY: Atria Books.

¹¹ Twenge, J. M. (2017). *iGen: Why today's super-connected kids are growing up less rebellious, more tolerant, less happy-- and completely unprepared for adulthood (and what this means for the rest of us)* (First Atria Books hardcover edition.). New York, NY: Atria Books.

¹² Twenge, J. M. (2017). *iGen: Why today's super-connected kids are growing up less rebellious, more tolerant, less happy-- and completely unprepared for adulthood (and what this means for the rest of us)* (First Atria Books hardcover edition.). New York, NY: Atria Books.



Recommendation: High Impact Practices

High Impact Practices (HIPs) are activities that increase students' intellectual and personal engagement. These activities can include research with a faculty member, service learning, internships, learning communities, study abroad, capstone experiences, and other highly engaging learning opportunities.¹³ HIPs were identified by George Kuh, Director of the National Institute for Learning Outcomes Assessment. He serves as an adjunct research professor of education policy at the University of Illinois and Chancellor's Professor Emeritus of Higher Education at Indiana University. He was one of the developers of the National Survey of Student Engagement (NSSE), an assessment administered by many institutions in the UNC System and across the nation to determine student engagement on campus.¹⁴ The NSSE can be used to measure students' reports of exposure to HIPs.

Research suggests that students who experience two or more HIPs have higher Grade Point Averages (GPAs) and increased retention and graduation rates (Association of American Colleges and Universities, 2018). These outcomes are especially impactful for underserved populations who often have less access to these types of learning experiences. While these activities have shown positive results for all races, research by George Kuh indicates that African-American students who experienced more HIPs were more likely to return for another year and have a higher GPA. In addition, Hispanic students were more likely to experience increased GPAs. Chico State University conducted a study that showed that Latino students who participated in more HIPs had a greater tendency to graduate on time, leading them to include the activities in their Graduation Initiative.¹⁵

To yield the best results for students, institutions should be intentional about providing quality HIPs, which requires assessment, disaggregated data, and an integrated approach. The activities should be connected to learning outcomes, defined, and provide evidence. George Kuh developed a rubric to measure the quality of HIPs, to ensure that students were receiving an appropriately rigorous and engaging learning experience.

The Association of American Colleges and Universities (AAC&U), a national organization concerned with the quality of student learning, first published Dr. Kuh's research, *High Impact Practices: What They Are, Who Has Access to Them, and Why They Matter*. The publication was produced for Liberal Education and America's Promise, also known as LEAP.¹⁶ Educators interested in improving student outcomes through greater engagement can investigate the resources available through these organizations.

Next Steps

¹³ Kuh, G. (2008). *High-Impact Educational Practices: What They Are, Who Has Access to Them, and Why They Matter*. Association of American Colleges and Universities

¹⁴ Indiana University. (2018). NSSE Institute Home. Retrieved from <http://nsse.indiana.edu/institute/>

¹⁵ Chico State University. (2018). Practices - Graduation Initiative - CSU, Chico. Retrieved November 13, 2018, from <https://www.csuchico.edu/gradinitiative/old/practices.shtml>.

¹⁶ Association of American Colleges and Universities. (2018). High-Impact Practices Publications. Retrieved November 13, 2018, from <https://www.aacu.org/resources/high-impact-practices/publications>

Institutions can increase student access to High Impact Practices (HIPs) and improve the quality of existing activities. This can be accomplished in the following manner:

- Department faculty may identify HIPs already used in their programs. They may include research with a faculty member, internships, service learning, study abroad, learning communities, capstone experiences, and other activities.
- Department faculty should attempt to ensure that each of their graduates will have had access to at least two HIPs during their time in the major. This may be accomplished by embedding a HIP in two required upper-division courses.
- Department faculty may use George Kuh's rubric for quality HIPs, to ensure that they stimulate students' intellectual and personal engagement.
- The institution may choose to increase access to learning communities and service learning for freshmen and sophomores, to improve retention rates.

Recommendation: Expand Mental Health Support

Bethany Meighen, the UNC System Office Interim Vice President for Academic and Student Affairs, shared suggestions to support students' mental health.

Institutions' offices of mental health services should expand access to regular therapy throughout the school year. Rural or online students may benefit from access to therapy online, via telephone, or other methods. In addition, managing flexible schedules for campus counselors can ensure that therapy is available after hours. This can help students who are in crisis during the evening or weekend.

Campus departmental units can invite mental health services personnel to educate faculty and staff about indicators that a student may be in crisis. This can be especially important near the mid-terms, when levels of student depression and anxiety may rise. Faculty can be alert for signs of student distress. Instructors can talk about de-stressors. Housekeeping staff may share with resident advisors if they see students not leaving their rooms. It is helpful to educate every person who has contact with students about mental health.



Figure 3. SGA helps students find their Zen Zone - Winston-Salem State University. Retrieved from <https://www.wssu.edu/about/news/articles/2017/05/sga-helps-students-find-their-zen-zone.html>

Positive campus activities and spaces that relieve stress may help address students' mental health. Winston-Salem State University has a quad called the Zen Zone (shown in Figure 3), sponsored by their Student Government Association. The Zone creates a relaxing space with hammocks and sessions on meditation and yoga. The campus Recreation Center provides yoga mats and therapy dogs are available through free services from an organization that trains the dogs.

Finally, Dr. Meighen suggests a strategy to support mental health that uses the acronym, "BEAST," as in "beast mode" (a slang term indicating high performance):

B = Build relationships with campus mental health counselors

E = Educate faculty and staff, especially near midterms

A = Activities to support connection and engagement

S = Stop the stigma. Use messages that support use of mental health services

T = Take care of yourself. Be a role model to students for self-care.

The combination of expanded access to mental health services, supportive spaces and activities on campus, and education of faculty and staff can create an atmosphere conducive to students' mental wellness.

Next Steps

Students may benefit from greater access to mental health resources and supportive spaces on campus that help relieve stress. This may be accomplished in the following manner:

- Campus mental health services may arrange flexible hours for counselors to facilitate sessions (by phone, online, etc.) after normal school hours. This may help students who are in crisis during evening hours when campus counseling centers are often closed.
- Providing access to counseling online may help students in remote locations, such as distance learners.
- Departmental units should invite campus mental health personnel to a faculty or staff meeting to educate them about mental health issues and indicators.
- Institutions may collaborate with their Student Government Organizations to identify and designate a space on campus for meditation, yoga, or stress-relieving sessions.
- Campus representatives may contact local organizations that provide access to therapy animals, meditation, yoga, or other stress-relieving activities.
- Faculty may choose to add contact information for campus mental health services on their syllabi. Faculty and staff may place posters advertising campus mental health services on their office doors.

Recommendation: Student Success Hub

As defined in the UNC Strategic Plan, student success is a combination of positive intellectual, personal, and social development facilitated by a high-quality university education.¹⁷ It also includes the timely acquisition of a degree. But the “experience” of student success may be different for each individual student. Universities need to take a holistic approach to what makes up a student. A student isn’t merely the sum of that person’s test scores. It includes community service, work experience, family background, life experience. And every student is different. We need to recognize that being a student is stressful, from the admissions process to attendance through to graduation, especially if you are first generation, where your family has no experience with the process, or a non-traditional student who may not fit the standard Monday thru Friday, eight to five schedule. These views are expressed by personnel in the UNC-Chapel Hill Admissions Office¹⁸ and the UNC-Chapel Hill Office of Undergraduate Retention.¹⁹ Even those in distance education at other UNC System campuses express the need to “put the student first,” with suggestions such as better websites for current students (as opposed to those for recruitment), especially for non-traditional students.²⁰

¹⁷ University of North Carolina System website. <https://www.northcarolina.edu/strategic-planning>

¹⁸ Legge, A & Davis, M. (2018, September 28). Personal interview

¹⁹ Cartmell, K. (2018, September 21). Personal interview

²⁰ Gilman, R. (2018, October 4). Personal interview.

The dominant suggestion heard from these source has been to streamline processes, reduce bureaucracy, and “create a one-stop shop for all the students’ needs.”²¹ Many schools combine services, via links on their websites, but not in-person.²² Some combine a few services, such as the registrar, cashier, and financial aid into one office,²³ but not many have a central location for students to go to for the majority of their needs. Recent, localized attempts around the UNC-Chapel Hill campus for shared services have focused on cost savings and back-end efficiencies,²⁴ but improved customer service is usually secondary. This effort has been echoed at other institutions, such as Indiana University in 2012.²⁵

This is where the idea of a Student Success Hub would apply. A centralized location where students receive academic, financial, and personal support. East Tennessee State University examined this possibility in 2009,²⁶ although it does not appear that it was implemented. But a model of this is already active in the UNC System with the Student Success Hub for Florence Recovery (since modified to include Hurricane Michael and other natural disasters), located in the Student Union on the UNC-Chapel Hill campus.²⁷ The Hub is designed to lessen the impact of the hurricane’s aftermath on affected students, taking on some of the responsibility of continuing their education during this time and easing some of the stress involved. With more experts and resources in one location, students receive quicker and less complicated service.

The Florence Hub is designed for a specific need, but the principal could be adapted for general use. Suggested offices providing representatives that would make up a Student Success Hub would be the Dean of Students, the Registrar, the Cashiers Office, Undergraduate Retention, Scholarships and Student Aid, Counseling, Academic Advising, and Career Services. Currently, these offices are housed in at least five different buildings, and would require a student to walk about two miles in order to visit each one.²⁸ That doesn’t include the time involved, for travel and for waiting to see the appropriate person. For a disadvantaged or non-traditional student, this process can be a discouraging barrier to continued success. The Florence Hub is designed for students to request support, but information about the general hub could be part of the standard information given to all incoming students. The hub would also need a strong web-based component, incorporating an interactive feature that extends support beyond office hours, which would provide more flexibility for all student categories. In addition, most employees manning the Florence Hub are operating beyond their normal job parameters, so staffing would have to be taken into account. Options might involve current employees rotating through scheduled times at the hub or new, specially-trained staff with hybrid job functions. It could also incorporate other student-related services such as Housing or Public Safety. The easiest way for any UNC campus to implement this idea would be through a satellite office in an existing building, similar to the Florence Hub in the Student Union. Larger campuses, especially those with specific fields of study grouped together, may benefit from multiple satellites for more focused academic needs. An example

²¹ Brinker, J. (2018, October 8). Personal interview.

²² University of San Francisco website. <https://www.usfca.edu/student-life/student-services>

²³ Marymount Manhattan website. <https://www.mmm.edu/offices/center-for-student-services/>

²⁴ Mckee, E. (2010, December 2). Personal communication.

²⁵ Indiana University Student Services Initiative Report. (2012, January 2). Retrieved from https://ussu.iu.edu/doc/student_services_initiative/SSI%20Phase%201%20Report.pdf

²⁶ Bielat, K & Yarrish, J. (2009, August 18). Student Financial Services: One-Stop Shopping. Retrieved from https://www.etsu.edu/125/taskforces/student_life_services/documents/student-financial-services-one-stop-shopping.pdf

²⁷ UNC-Chapel Hill Student Success Hub for Florence Recovery website. Retrieved from <https://www.unc.edu/florence/hub/>

²⁸ Cartmell, K. (2018, September 21). Personal interview.

of the satellite concept was implemented by the UNC-CH College of Arts and Sciences several years ago when their Dean's Office was moved temporarily, several miles away from campus.²⁹ A satellite Human Resources office was created in Coker Hall to alleviate the travel burden for employees, especially new employees and student employees who are required to present I-9 documentation in-person.

Next Steps

- Examine statistics (pros/cons) on the Florence Hub and establish best practices for a dedicated success hub, based on the needs of the campus
- Consult representatives from the applicable offices for that campus to determine best usage of resources
- Examine existing space on each campus that could house a dedicated hub

Technology

We are in the midst of the fourth Industrial Revolution, an era of exponential advances and application technology that the world has never seen.³⁰ This era is often described as *cyber-physical*; an era in which many physical systems including power plants, industrial complexes, transportation systems, farms, and retail establishments are networked, collect large amounts of data, and can make decisions based on the data collected, often in real-time. As we move into the 2020s, these connected systems will leverage advances in artificial intelligence, robotics and sensing, along with big data sets to become more efficient. This will lead to disruption in the workplace as unskilled, repetitive work is automated. This disruption presents a significant opportunity for the educational market.

Artificial intelligence is simply *the capability of a machine to imitate intelligent human behavior*.³¹ This intelligent behavior is typically limited to a specific problem such as winning a game or identifying an animal in an image. These systems work, without human intervention, by identifying the most important patterns in big data sets. The more data these systems have the better they perform. For example, the best player of the game Go, an ancient strategy game similar to chess, is the computer system named AlphaZero that learned how to play the game by playing itself millions of times and accumulating large amounts of data.³² A good example of practical application of artificial intelligence may be next to you on the highway. Twenty-five years ago few people would have predicted that we would have fully autonomous cars on the roads and yet Google Waymo has

²⁹ Diallo, A. (2015, August 17). Personal communication.

³⁰ Schwab, K. (2016). *The Fourth Industrial Revolution: what it means, how to respond*. Retrieved from <https://www.weforum.org/agenda/2016/01/the-fourth-industrial-revolution-what-it-means-and-how-to-respond/>

³¹ Artificial Intelligence. 2018. In *Merriam-Webster.com*. Retrieved November 15, 2018, from <https://www.merriam-webster.com/dictionary/artificial%20intelligence>

³² Silver, D., Schrittwieser, J., Simonyan, K., Antonoglou, I., Huang, A., Guez, A., Hubert, T., Baker, L., Lai, M., Bolton, A., Chen, Y., Lillicrap, T., Hui, F., Sifre, L., Van den Driessche, G., Graepel, T., & Hassabis, D. (2017), Mastering the game of Go without human knowledge. *Nature v 550*, p 354–359, Retrieved from <https://www.nature.com/articles/nature24270>

already logged 10 million miles on public roads.³³ We believe we are just beginning to see what machines are capable of.

Automation will bring big shifts to the world of work, as AI and robotics change or replace some jobs.

-McKinsey Global Institute

McKinsey is not alone in their prediction noted above: as shown in the figure below the World Economic Forum predicts that machines will move from being responsible for about a third of all economic output today to just over fifty percent before the end of the next decade. Dr. Kai-Fu Lee, an expert on artificial intelligence and chairman of a large investment firm, projects that in fifteen to twenty-five years developed economies will see half of all work performed by machines.

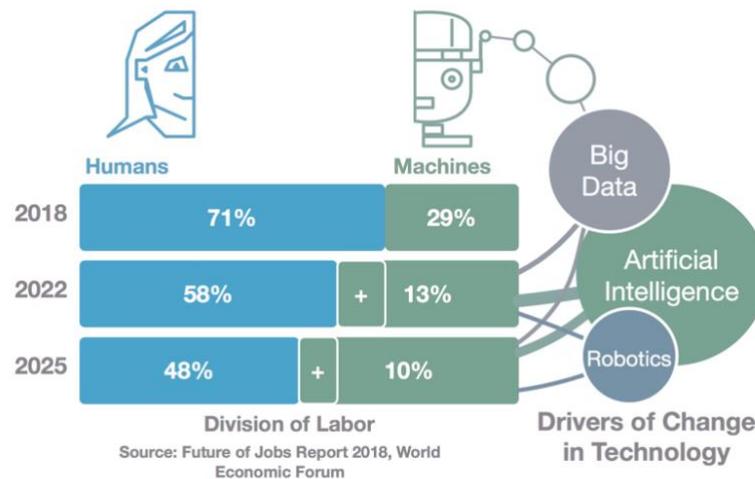


Figure 4: Total World Labor by Type

Employees, employers, and those seeking work will look for additional training or additional education in order to remain in a more competitive workforce. As shown below, the McKinsey Global Institute thinks these technological changes will lead to approximately one in ten workers in the United States seeking training or re-skilling lasting longer than one year.³⁴

³³ Korosec, K. (2018). *Waymos self-driving cars hit 10 million miles*. Retrieved from <https://techcrunch.com/2018/10/10/waymos-self-driving-cars-hit-10-million-miles/>

³⁴ McKinsey Global Institute. (2017). *Jobs Lost, Jobs Gained: Workforce Transitions in a Time of Automation*. Retrieved from <https://www.mckinsey.com/~/media/mckinsey/featured%20insights/future%20of%20organizations/what%20the%20future%20of%20work%20will%20mean%20for%20jobs%20skills%20and%20wages/mgi-jobs-lost-jobs-gained-report-december-6-2017.ashx>

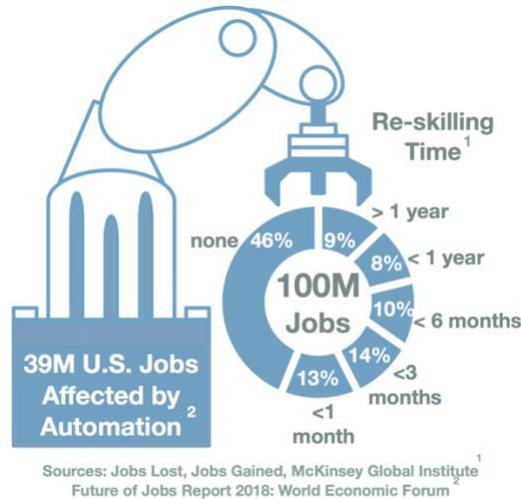


Figure 5: Retraining time for US workforce by 2030

This presents an enormous opportunity for higher education with a possibility of millions of new students. However, it also presents a potential risk to higher education if the demand for training and education is met by just one or two large private corporations. These private corporations could then begin to compete with existing colleges and universities, leveraging technology advances and novel funding models to meet the demand.

Technology will have a profound impact on society in the next decade leading to an increased demand for training and education. As work is automated workers in the United States will look to retrain or gain additional education in order to remain competitive in a changing job market. Most of those seeking additional education or skills will be non-traditional students. Higher education must recognize these upcoming changes and strive to meet the needs of both workers and employers in this new market.

Recommendation: Digital Badges, Credentials & Certifications

Given the magnitude and speed of anticipated technological change, a complete disruption in higher education – not just mere innovation – is demanded.³⁵ In fact, micro-credentialing and badging were named a “2016 Disruption of the Year” because they can quickly provide employers with a more detailed glimpse of graduates’ abilities, thus making them more practical than traditional grades and

³⁵ Craig, R. (2015). *College Disrupted: The Great Unbundling of Higher Education*. St. Martin's Press.

transcripts.³⁶ Some have proposed the following analogy: What e-commerce is to retail, e-credentials are to higher education.³⁷

Education is no longer the 3 R's: reading, writing, and arithmetic.³⁸ At present, for elite institutions, it is the 4 R's: rankings, research, real estate, and rah! (sports).³⁹ For the rest, it will be an unbundling of packaged courses and degrees into badges – with a particular emphasis on graduation, wages, and employment.⁴⁰ This potentially marks a transition from a degree-based economy to competency-based – an overthrowing of the “tyranny of the degree.”⁴¹ In response, legions of students and lifelong learners are gaining new skills, interests, and competencies to ensure social and economic mobility.⁴²

Cathy Davidson, co-founder of the Humanities, Arts, Science and Technology Alliance Collaboratory, describes the landscape as such: “People seem to think they know what school is and they know what work is. We work in a world where anyone can learn anything, anytime, anywhere, but we haven’t remotely reorganized our workplace or school for this age.”⁴³

Traditional physical badges have been used for hundreds of years by the United States Army and the Boy Scouts of America to give members an emblem to display the accomplishment of various achievements.⁴⁴ The idea of digital badges is a relatively recent development drawn from research into gamification.⁴⁵ In 2005, the Xbox 360 introduced its Gamescore System, which is considered to be the original implementation of a digital achievement system.⁴⁶ In 2011, Peer 2 Peer University and The Mozilla Foundation authored a white paper, “An Open Badge System Framework”, marking the beginning of digital badges as education credentials.⁴⁷ The idea is well established in computer programming: Microsoft developed a certification program to let employees show mastery of certain computer systems.⁴⁸ NASA, NOAA, Intel, Disney-Pixar, and the US Department of Veteran Affairs have also developed digital badge systems.⁴⁹

³⁶ Hickey, D. & Willis I. (2017) *Where Open Badges Appear to Work Better: Findings from the Design Principles Documentation Project*. Bloomington, IN: Center for Research on Learning and Technology.

³⁷ Grant, S. (2016) *Promising Practices of Open Credentials: Five Years of Progress*. Retrieved from <https://drive.google.com/file/d/0B7kHRuri9QdPQmRfdXZrbpSXOU/view>

³⁸ Hickey, D. (2017) *How Open Credentials Will Transform Higher Education*. Retrieved from <https://www.chronicle.com/article/How-Open-E-Credentials-Will/239709>

³⁹ Craig, R. (2015). *College Disrupted: The Great Unbundling of Higher Education*. St. Martin's Press.

⁴⁰ Craig, R. (2015). *College Disrupted: The Great Unbundling of Higher Education*. St. Martin's Press.

⁴¹ Grant, S. (2016) *Promising Practices of Open Credentials: Five Years of Progress*. Retrieved from <https://drive.google.com/file/d/0B7kHRuri9QdPQmRfdXZrbpSXOU/view>

⁴² Grant, S. (2016) *Promising Practices of Open Credentials: Five Years of Progress*. Retrieved from <https://drive.google.com/file/d/0B7kHRuri9QdPQmRfdXZrbpSXOU/view>

⁴³ Briggs, S. (2018) *Out With the Degree, In With the Badge: How Badges Motivate Learning And 7 Tips To Use Them Right*. Retrieved from <https://www.opencolleges.edu.au/informed/features/badges-in-education>

⁴⁴ Briggs, S. (2018) *Out With the Degree, In With the Badge: How Badges Motivate Learning And 7 Tips To Use Them Right*. Retrieved from <https://www.opencolleges.edu.au/informed/features/badges-in-education>

⁴⁵ Briggs, S. (2018) *Out With the Degree, In With the Badge: How Badges Motivate Learning And 7 Tips To Use Them Right*. Retrieved from <https://www.opencolleges.edu.au/informed/features/badges-in-education>

⁴⁶ Briggs, S. (2018) *Out With the Degree, In With the Badge: How Badges Motivate Learning And 7 Tips To Use Them Right*. Retrieved from <https://www.opencolleges.edu.au/informed/features/badges-in-education>

⁴⁷ Briggs, S. (2018) *Out With the Degree, In With the Badge: How Badges Motivate Learning And 7 Tips To Use Them Right*. Retrieved from <https://www.opencolleges.edu.au/informed/features/badges-in-education>

⁴⁸ Briggs, S. (2018) *Out With the Degree, In With the Badge: How Badges Motivate Learning And 7 Tips To Use Them Right*. Retrieved from <https://www.opencolleges.edu.au/informed/features/badges-in-education>

⁴⁹ Briggs, S. (2018) *Out With the Degree, In With the Badge: How Badges Motivate Learning And 7 Tips To Use Them Right*. Retrieved from <https://www.opencolleges.edu.au/informed/features/badges-in-education>

Nationally, the term “micro-credential” is often used interchangeably with badge, digital badge, and/or digital credential, as badges are one of the most common types of micro-credentials issued.⁵⁰ Common types of micro-credentials include digital badges, stackable credentials, for credit, non-credit-to-credit pathways, massive open online course, licensure, prior learning assessment, and industry-recognized credentials.⁵¹

At their most basic, micro-credentials verify, validate, and attest that specific skills and/or competencies have been achieved.⁵² The meta-data behind the badge reveals how it was earned, who issued it, the date of issue, and a link to some form of artifact relating to the work behind the badge.⁵³ The value of badges comes less from its visual representation than from the context around how and why it was conferred.⁵⁴ Micro-credentials can be offered online, on-campus, or via a hybrid of both.⁵⁵

Many of the new digital badges are easy to maintain in order to keep students motivated, while others signal mastery of granular skills that are not formally recognized in a traditional classroom (Briggs). Badges have been successfully used to set goals, motivate behaviors, represent achievements and communicate success in many contexts.⁵⁶ When learning happens across various contexts and experiences, badges can have a significant impact, and can be used to motivate learning, signify community, and signal achievement.⁵⁷

They differ from traditional degrees in that they are generally offered in shorter or more flexible timespans, and tend to be more narrowly focused.⁵⁸ The digital nature of these credentials provides significant affordances and can offer greater ongoing value than the more traditional format for recognizing or recording learning, such as a degree, an academic course-level transcript, or a paper-based certificate of completion.⁵⁹

Once a badge “ecosystem” is developed, people can display an e-portfolio or “digital backpack” of their badges, degrees, and other credentials.⁶⁰ Employers are able to click on a badge to see the meta-data behind the badge – in effect producing a “three-dimensional transcript” which augments the traditional

⁵⁰ SUNY Micro-Credentialing Task Force. *SUNY Micro-Credentialing Task Force Report and Recommendations*. (2018, 23 January). Retrieved from <http://www.nysed.gov/common/nysed/files/principal-project-phase-2-suny-microcredentials.pdf>

⁵¹ SUNY Micro-Credentialing Task Force. *SUNY Micro-Credentialing Task Force Report and Recommendations*. (2018, 23 January). Retrieved from <http://www.nysed.gov/common/nysed/files/principal-project-phase-2-suny-microcredentials.pdf>

⁵² SUNY Micro-Credentialing Task Force. *SUNY Micro-Credentialing Task Force Report and Recommendations*. (2018, 23 January). Retrieved from <http://www.nysed.gov/common/nysed/files/principal-project-phase-2-suny-microcredentials.pdf>

⁵³ Briggs, S. (2018) *Out With the Degree, In With the Badge: How Badges Motivate Learning And 7 Tips To Use Them Right*. Retrieved from <https://www.opencolleges.edu.au/informed/features/badges-in-education>

⁵⁴ Briggs, S. (2018) *Out With the Degree, In With the Badge: How Badges Motivate Learning And 7 Tips To Use Them Right*. Retrieved from <https://www.opencolleges.edu.au/informed/features/badges-in-education>

⁵⁵ SUNY Micro-Credentialing Task Force. *SUNY Micro-Credentialing Task Force Report and Recommendations*. (2018, 23 January). Retrieved from <http://www.nysed.gov/common/nysed/files/principal-project-phase-2-suny-microcredentials.pdf>

⁵⁶ Briggs, S. (2018) *Out With the Degree, In With the Badge: How Badges Motivate Learning And 7 Tips To Use Them Right*. Retrieved from <https://www.opencolleges.edu.au/informed/features/badges-in-education>

⁵⁷ Briggs, S. (2018) *Out With the Degree, In With the Badge: How Badges Motivate Learning And 7 Tips To Use Them Right*. Retrieved from <https://www.opencolleges.edu.au/informed/features/badges-in-education>

⁵⁸ SUNY Micro-Credentialing Task Force. *SUNY Micro-Credentialing Task Force Report and Recommendations*. (2018, 23 January). Retrieved from <http://www.nysed.gov/common/nysed/files/principal-project-phase-2-suny-microcredentials.pdf>

⁵⁹ Diaz, V., Finkelstein, J. & Manning, S. *Developing a Higher Education Badging Initiative*. 2015, 15 August). Retrieved from <https://library.educause.edu/resources/2015/8/developing-a-higher-education-badging-initiative>

⁶⁰ Jacobs, J. (2012) *Digital Badges Threaten Colleges' Monopoly on Credentials*. Retrieved from <https://www.usnews.com/education/best-colleges/articles/2012/01/20/digital-badges-threaten-colleges-monopoly-on-credentials>

degree.⁶¹ A growing number of colleges are working with vendors to use badges as an add-on to degrees, to help students display skills and accomplishments that transcripts fail to capture.⁶²

For most employers, undergraduate degrees are a check box that communicates very little about the skills a particular candidate possesses.⁶³ The value of a degree comes mostly from the presumed general authority of the granting institution – and the fact that traditional colleges have a legally enforced near-monopoly over the production of credentials that are widely accepted for the purposes of getting a job or pursuing advanced education.⁶⁴ Resumes are flat and difficult, if not impossible, to verify.⁶⁵ Social or 21st-century skills, which are invaluable to employers and correlated with job success, rarely show up on a transcript.⁶⁶ As Ryan Craig, Author of *College Disrupted* explains, “A degree doesn’t say a lot. A badge can say a lot more. The primary credential we use in our labor market is the degree. Badges breaks that down into literally competencies. What (badges) are signaling is the shift from degree-based hiring to competency-based hiring.”⁶⁷

Using evidence-based digital badges to capture skills and competencies is a chance to change the landscape of making what and how people are learning any time, any place, and any pace count (Grant). David Wiley of Brigham Young University marks the tipping point: “As soon as big employers everywhere start accepting these new credentials, either singly or in bundles, the gig is up completely.”⁶⁸

How Badges, Certificates, and Credentials Can Serve the Underserved

The following section identifies and describes which badge, certificate, or credential would best fit a given learner persona and then how it will serve the higher education needs of that particular population. The description includes necessary experience, access, affordability, schedule, timeline, curriculum, completion, employment, wages, and miscellaneous features.

Learner Persona: Phyllis (Low Income)

Badge, Certificate, and Credential: Google IT Support Professional Certificate

- *Description*

The IT Support Professional Certificate, developed by Google and hosted on Coursera, helps job-seekers become ready for an entry-level job in IT Support in about eight months. The training involves a dynamic mix of hands-on labs and interactive assessments – introducing students to the fundamentals

⁶¹ Fain, P. (2016) *Digital Badging Spreads as More College Use Vendors to Create Alternative Credentials*. Retrieved from <https://www.insidehighered.com/news/2016/08/09/digital-badging-spreads-more-colleges-use-vendors-create-alternative-credentials>

⁶² Fain, P. (2016) *Digital Badging Spreads as More College Use Vendors to Create Alternative Credentials*. Retrieved from <https://www.insidehighered.com/news/2016/08/09/digital-badging-spreads-more-colleges-use-vendors-create-alternative-credentials>

⁶³ Briggs, S. (2018) *Out With the Degree*, In *With the Badge: How Badges Motivate Learning And 7 Tips To Use Them Right*. Retrieved from <https://www.opencolleges.edu.au/informed/features/badges-in-education>

⁶⁴ Briggs, S. (2018) *Out With the Degree*, In *With the Badge: How Badges Motivate Learning And 7 Tips To Use Them Right*. Retrieved from <https://www.opencolleges.edu.au/informed/features/badges-in-education>

⁶⁵ Briggs, S. (2018) *Out With the Degree*, In *With the Badge: How Badges Motivate Learning And 7 Tips To Use Them Right*. Retrieved from <https://www.opencolleges.edu.au/informed/features/badges-in-education>

⁶⁶ Briggs, S. (2018) *Out With the Degree*, In *With the Badge: How Badges Motivate Learning And 7 Tips To Use Them Right*. Retrieved from <https://www.opencolleges.edu.au/informed/features/badges-in-education>

⁶⁷ Sreenivasan, H. (2016) *Giving Students a Leg Up With Job Skills a Resume Won’t Show*. Retrieved from <https://www.pbs.org/newshour/show/giving-students-leg-job-skills-resume-wont-show>

⁶⁸ Briggs, S. (2018) *Out With the Degree*, In *With the Badge: How Badges Motivate Learning And 7 Tips To Use Them Right*. Retrieved from <https://www.opencolleges.edu.au/informed/features/badges-in-education>

of IT support that are critical for success in the workplace. IT Support is a dynamic, fast-growing field – faster than the average of all other occupations. Google faced a challenge in finding qualified candidates to join its IT Support team which inspired the creation of this new training program.

Experience	No tech experience or college degree necessary.
Access	Open enrollment; online training program hosted by Coursera.
Affordability	Reduced monthly subscription; need-based scholarships available through non-profits that serve under-represented.
Schedule	Follow suggested course order or choose own and able to skip through familiar content directly to assessments.
Timeline	Average time to complete program is 8 months when dedicating 8–10 hours a week.
Curriculum	Dynamic mix of hands-on labs and interactive assessments, developed by Googlers.
Completion	Certificate integrated into community college IT offerings – aligning with skills that employers desire.
Employment	Entry-level job in IT Support with certificate co-signers who are coincidentally top employers hiring for such jobs.
Wages	Median annual wage for support specialists is \$52,000.
Miscellaneous	Can earn up to 12 credits towards online Bachelor’s Degree in IT – for jobs in broader and beyond IT, tech fields.

- *Service to Low-Income Population*

Phyllis appreciates the program’s affordability: its scholarships and reduced rates as well as monthly payment options rather than semester-based tuition. Google developed an online, authentic learning experience which prepares for her for workplace success – via a condensed timeline. Coursera offers open enrollment and permits immediate class start. It also offers Phyllis the ability to self pace through the courses in addition to start/stop without losing her option to continue. Upon completion, she can highlight the certification on her resume or LinkedIn. Industry partnerships help Phyllis find, place, and transfer to a new career quickly. The median income and prospect of employment with big name employers will go far to boast her family’s way of life and her self esteem. Moreover, Phyllis has the opportunity to ladder her certificate into an undergraduate degree – thus opening up additional avenues of career advancement.

Learner Persona: Mark (Degree-Completer)

Badge, Certificate, and Credential: UNC Charlotte’s 49er Finish (Partway Home Initiative)

- *Description*

UNC Charlotte’s 49er Finish uses innovative marketing strategies, unique personalized advising, and intentional programming to assist stopped-out students to complete their degrees. Higher education institutions often refer to students as “stop outs” who at some point paused their academic careers, often due to circumstances such as military service, family obligations, financial or health issues. The UNC System believes that a better educated population provides a stronger workforce and socioeconomic benefits to the state.

Experience	Former undergraduate student with 90+ credit hours, 2.0+ GPA, in good standing, stopped out for at least one year.
Access	4 readmission application deadlines; \$60 readmission application fee waived.
Affordability	FAFSA, Osher Reentry Scholarship, Carol A. Douglas Reentry Scholarship, OASES Scholarships; Payment Plans.
Schedule	Classes offered after 5:00pm and on weekends, but not all courses are offered during these times.

Timeline	Timely degree completion through collaboration with academic and administrative departments.
Curriculum	Receive course credit through Challenge Examination and College Level Examination Program.
Completion	Program coordinator acts advocate on behalf of student to navigate institutional policy and overcome obstacles.
Employment	65% of U.S. jobs will require some form of postsecondary education by 2020.
Wages	Office of Adult Students & Evening Classes: orientation, honor societies, social and educational programming.
Miscellaneous	Unique high-touch, concierge-style advising model assigns student one direct point of contact throughout process.

- *Service to Degree-Completer Population*

49er Finish offers Mark a unique concierge-style approach to advising. It prizes getting to know Mark as an individual and providing high-touch support from recruitment to graduation. The program aims to make the transition as smooth as possible and help him overcome any obstacles for returning – by providing degree planning, liaising, life coaching, and programming. Degree Planning – Mark may need or want to change majors, or need assistance tailoring course choices for new career goals. Liaising – the program coordinator will actively assist in Mark getting connected with academic departments and other university resources by providing direct contacts which will make him feel more comfortable seeking advisement and assistance. Life Coaching – the concierge “one-stop” approach involves providing connections and resources for administrative issues, community services, (finding child care, etc.), and supporting and encouraging Mark throughout his degree completion. Programming – specific program initiatives include welcome-back seminars, mentoring programs, unique scholarship opportunities, ongoing transition seminars, and referrals to appropriate campus resources.

Learner Persona: Felicia (Military/Veterans)

Badge, Certificate, and Credential: Code Platoon

- *Description*

Code Platoon helps (CP) veterans and military spouses transition into the civilian workforce by providing technical training and career placement. CP transforms them into software developers through an immersive, hands-on, educational process (i.e. coding boot camp) and paid internship program. For 14 weeks, students learn by doing in a collaborative environment – coding, applying principles taught in lectures, and solving complex code challenges which simulate the real-world work experience.

Experience	No previous programming skills are required.
Access	Enrollment open three times per year. In-person classes are in-person with some exceptions for remote learning.
Affordability	\$10k median scholarship amount awarded to Veterans, and Code Platoon is GI Bill-approved.
Schedule	Immersive, full-time, full-stack coding boot camp – 6 to 7 days a week and 12 to 14 hours a day.
Timeline	14 weeks.
Curriculum	Work in teams to solve complex code challenges – simulating real-world work experience.
Completion	Hireable as junior full stack web developer.
Employment	82% of graduates employed within 180 days after completing program.
Wages	Median salary \$65,000 (aligns with four-year computer science degree); median salary \$100,000 within 2 years.
Miscellaneous	Holistic training, interview preparation, job counseling, and employer matching.

- *Service to Military/Veteran Population*

Felicia appreciates the personalized career counseling to help find, place, and transfer her to a new career ASAP. Authentic learning experiences will prepare her for workplace success. Scholarships and the GI Bill should lower financial barriers for her. The course lends itself to minimal learner isolation – with constant access to faculty and technology. The instruction is geared towards adults and fosters learning communities. She will receive a specific credential on a condensed timeline. Code Platoon offers significant support to students – beyond just the curriculum. Felicia possesses innate and boundless motivation, will, and a desire to succeed in life. She is focused, hard-working, resilient, and self-reliant – which will serve her well when learning to program (and working as a programmer) which requires constant learning and overcoming roadblocks.

Learner Persona: Claire (Rural)

Badge, Certificate, and Credential: Business Essentials (UNC Kenan-Flagler Business School)

- *Description*

UNC Business Essentials is a 100% online business certificate program which covers business fundamentals. The program provides working professionals and students with non-business majors the business skills they need to pursue their career goals and get a leg up on today’s competitive job and internship market. Students improve their résumés, learn key business skills, and develop the confidence they need to succeed in the business world.

Experience	No academic prerequisites required for enrollment.
Access	Accepted on rolling basis. Flexible easy-to-use, online format: whenever and wherever access internet connection.
Affordability	Not eligible for financial aid, NC 529 program, or Post-911 GI Bill. Chapter 31 Benefits may be used.
Schedule	Start whenever most convenient. Self pace given everyday schedule. Agilix adapts to individual learning style.
Timeline	4-5 hours a week over 4 months.
Curriculum	Six online courses created by faculty experts. Access 24/7 support from tutors via interactive message boards.
Completion	Each of six Business Essentials courses takes average of 10-12 hours to complete.
Employment	Marketable skills position students to contribute in ways that move beyond main area of expertise.
Wages	Develop business fundamentals needed to get ahead – whether beginning career or expanding career.

- *Service to Rural Population*

Claire appreciates the program’s anywhere/anytime access, its convenient start options, and open enrollment. In effect, the program acknowledges that personal and work-related obligations are just as important as her pursuit of the certificate. That she juggles work, financial, educational, and familial obligations – her energy and time are limited. Moreover, online access negates any travel necessary to support “time-shifting” care for children and elderly parents. Under the circumstances, she has no interest in the on-campus social experience – preferring to remain in her rural location. She can avail herself of substantial academic support from the 24/7 online tutors. The real-world business training prepares for workplace success and in a short time period.

Learner Persona: Jessica (iGen)

Badge, Certificate, and Credential: Digital Backpack (Co-/Extra-Curricular Transcript)

- *Description*

A co-/extra-curricular transcript (CCT) is a record compiled in an online portal and is an opportunity for students to have a record of their involvement and accomplishments that lists out-of-classroom experiences. This can be used to apply for grad school, provide speaking points for job interviews, and to showcase leadership experience. The CCT for UNC-Chapel Hill is Heel Life, Jessica can scroll through it – adding and sorting positions, organization memberships, experiences, reflections, and service hours. She can decide what to show or not show on her personal record as well as to add reflections to her experiences. When she is finished customizing her record, she can print her record or save it as a PDF.

- *Service to iGen Population*

With digital badges, Jessica will be engaged by fast feedback, frequent rewards, smaller segments, digital format, fluidity and flexibility, and the ability to create and curate her online presence (Elmore). Fast feedback offers more frequent benchmarks to help Jessica see and measure personal improvement. In effect, it gamifies her transcript, resume, and career. Frequent rewards – these incentivize Jessica to stay and keep working. Badges sustain her interest even when the rewards are not visible at first. Smaller segments – digital badges unpack the four-year experience, an academic year, a semester, a course into smaller, more digestible segments of content – which enables her to stay more engaged over the long run. Digital format – to Jessica, a smart phone is not a piece of groundbreaking technology but technology whose functionality and ease of use she takes for granted. She wants to easily pull up her digital backpack on one of the five screens which she monitors. Fluidity and flexibility – badges can put Jessica at the center of her academic path – rather than revolving around one college. Compared with academic courses, badges are more fluid and flexible which can adjust to her new reality. Create and curate – badges empower her to create and curate her online presence – mixing and matching ideas which best represents her personal brand.



Flexible Learning

Flexible learning is about delivering learning experiences at the

- most appropriate time,
- in the most appropriate format, and
- in the appropriate place for the individual learner.

Essentially, it departs from the “one size fits all” learning model of traditional higher education...and this model, as we all know is this/what:

Students between the ages of 18-23 come to a university, live on-campus, matriculate into a degree program, go to lecture-based classes as groups, take exams at specific times, and move through coursework in (mostly) consecutive semesters until obtaining a four-year undergraduate degree.

The next two recommendations will focus on strategies for making learning more flexible in ways that improve access and student success.



Recommendation: Expand & coordinate online offerings.

Expanding online offerings

Over the past ten years, high speed internet, remote conferencing technology, and more robust learning management systems have allowed for high-quality content delivery and interaction to happen online. Yet 58% of rural populations currently say access to high speed internet is a problem in their area⁶⁹.

In fact, a Lumina foundation study that shows that approximately a million North Carolinians really could benefit from a college education, but for a variety of reasons, such as family obligations and employment, they can't come to any of our traditional campuses.⁷⁰

Without reliable broadband internet access, potential rural students are unable to participate in online higher education offerings.

However, government lobbyists and two executive orders signed in 2018, of which one directs the Department of Interior to make 20% of the assets available in rural areas for rural broadband deployment⁷¹ suggest that over the next 10 years, high-speed internet will expand into rural areas, making the use of internet-based learning technologies possible. This opens the door for people in rural areas to access higher education using a variety of models that can enable rural and non-traditional students to attend higher education institutions while maintaining jobs and family life.

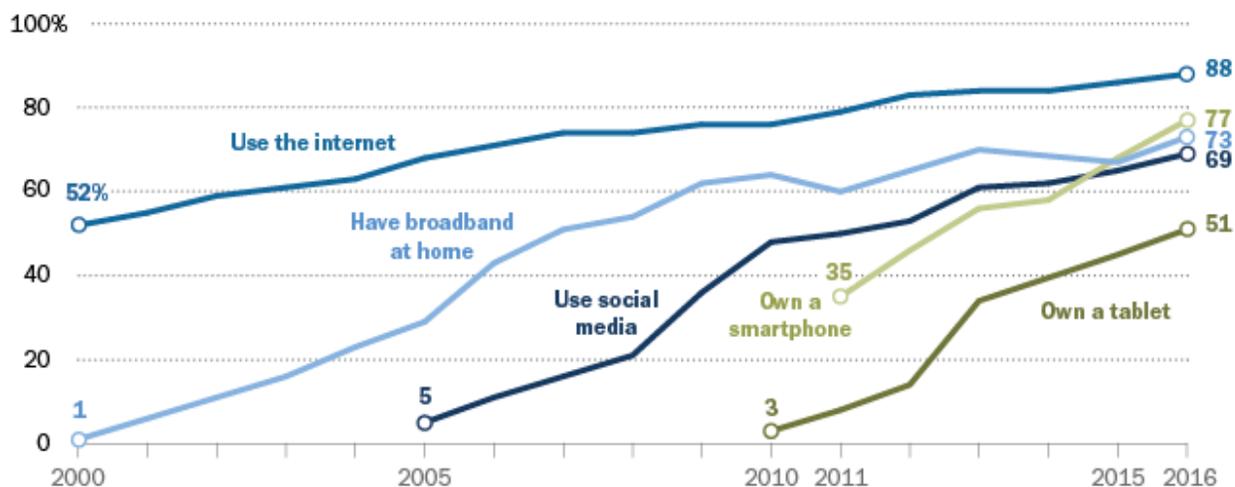
⁶⁹ Anderson, M. (2018) *About a quarter of rural Americans say access to high-speed internet is a major problem* Retrieved from <http://www.pewresearch.org/fact-tank/2018/09/10/about-a-quarter-of-rural-americans-say-access-to-high-speed-internet-is-a-major-problem/>

⁷⁰ Lumina Foundation. (2018). A Stronger Nation report.

⁷¹ Walljasper, C. (2018). *Reliable Rural Broadband: A Near-Future Reality or All Talk?* Retrieved from <https://www.agweb.com/article/reliable-rural-broadband-a-near-future-reality-or-all-talk/>

The evolution of technology adoption and usage

% of U.S. adults who ...



Source: Surveys conducted 2000–2016. Internet use figures based on pooled analysis of all surveys conducted during each calendar year.

PEW RESEARCH CENTER

Figure 6. The evolution of technology adoption and usage. Pew Research Center (2017, January 11). Retrieved from http://www.pewresearch.org/fact-tank/2017/01/12/evolution-of-technology/ft_17-01-10_internetfactsheets/

Because rural students are a target demographic for much of the UNC system – and because these students typically cannot leave their physical location because of jobs and families, expanding online offerings provides them with an avenue of accessing higher education.

Coordinating online offerings

The UNC system, and even individual universities, such as UNC Chapel Hill have a variety of online offerings which aren't formally coordinated. For example, NC State University has a robust home-grown distance education program called DELTA, which began in 1999.⁷² Yet other system schools, such as Elizabeth City State do not have any online offerings. Similarly, there are seven straight MBA programs offered throughout the system, some of which were developed in-house, while others were developed in partnership with 2U, an outside vendor.⁷³ Within UNC Chapel Hill itself, which offers 22 online programs, there is little, if any consistency and efficiency in administration. In this decentralized school, professional schools and individual departments may choose to stand up their own online program without coordinating with any others on-campus.⁷⁴ There is an opportunity for UNC Chapel Hill – and even the UNC system – to develop an institution-wide strategy for how to develop a strategic, aligned

⁷² Miller, T. (2018, October 1). Personal interview.

⁷³ UNC Online website:

https://programs.northcarolina.edu/search?°ree_level%5B%5D=Master&field_of_study%5B%5D=Business&orderBy=program_name

⁷⁴ Nicolet, T. (2018, October 15). Personal interview.

initiative and coordinating presence for addressing flexible learning needs for undergraduate and other populations that can help align what units are doing and provide support to help those units achieve their goals.⁷⁵

To begin addressing this, UNC Chapel Hill's Chancellor has appointed a task force, which lines up with the Blueprint for Next; an extension of this group still continues and is looking at options for developing a system for making intentional, coordinated decisions around online and flexible learning offerings.⁷⁶ At the NC System level, the Digital Learning Initiative has worked with the consulting firm Tyton Partners to identify online growth opportunities for the UNC System as a whole⁷⁷, as well as recommend strategies for meeting specific market opportunities.⁷⁸

Such a coordinated system has the ability to use big data, administrative efficiency, collective bargaining power, and shared resources to drive a strategy that supports increased access and student success.

Next steps:

Expanding and coordinating online offerings requires a coordinated NC System-level effort, as well as coordinated efforts within individual institutions.

Task forces should be formed within institutions charged with:

- conducting SWOT analyses of current online offerings,
- proposing potential ways to improve coordination, communication, and efficiencies, and
- sharing results with a larger system-wide task force.

A NC System-wide task force that coordinates with the NC System Digital Learning Initiative team should be formed, charged with:

- evaluating SWOT analyses from the 17 system institutions
- evaluating results from institutional task forces and market research from consultants, and
- proposing approaches and recommendations to the 17 institutions for a more coordinated, competitive online education strategy that benefits the entire NC System office, and
- developing a strategic plan and strategy to generate buy-in and success.

⁷⁵ Nicolet, T. (2018, October 15). Personal interview.

⁷⁶ Nicolet, T. (2018, October 15). Personal interview.

⁷⁷ Ptaszynski, J. (2018). Digital Learning Initiative presentation. Retrieved from <https://myapps.northcarolina.edu/digitalllearning/wp-content/uploads/sites/45/2018/08/DLI.JPtaszynski.180518.pdf>

⁷⁸ Fall 2018 Digital Learning Initiative Working Meeting. 10/25/18, 91-5p. Carolina Club, Chapel Hill, NC



Partner with local businesses, community colleges, & extension offices to provide local, in-person opportunities

A survey of 1500 students showed that 59% of completely online students come to campuses to meet with professors and fellow students. They also say they want to

- stay close to home,
- get quick results,
- have community-building opportunities,
- and have interaction.⁷⁹

Not only do students say they prefer to stay close to home, but their actions demonstrate it. Research indicates that the majority of “exclusively distance” students live in the same state as their institution.⁸⁰ And, data from online degree programs also support this. 2U, which is a for-profit vendor that helps higher education institutions develop, market, and administer online degrees, uses analytics and machine learning to guide its marketing strategy. They say the “vast majority of students in their degree programs come from a 500-mile radius around the program.”⁸¹

Both 2U and NCSU’s distance program DELTA see a convergence of on-campus and online models for degree offerings.^{82, 83} As Alex Makler from 2U says, “Campuses will not be destroyed from [offering online degrees], they’ll be enhanced.”⁸⁴

Data from 2U also shows that higher education disciplines are requiring students come to campus and on-campus students want to have some flexibility go online while maintaining in-person relationships.⁸⁵ To meet these community-building and interaction needs, 2U has partnered with WeWork⁸⁶ – a co-working company -- to provide students co-learning spaces around the country.

Higher education institutions within the NC System have many local entities to consider partnering with to provide online students with community-building and interaction opportunities. North Carolina has an extensive community college system that has physical learning spaces for meetings with fellow students and (potentially) adjunct faculty and labs that can be used by local students to conduct experiments. In areas that do not have community colleges, some local businesses, such as

⁷⁹ Dimeo, J. (2017). *Report: Online Students Seek Interaction and “Speed to Degree.”* Retrieved from <https://www.insidehighered.com/digital-learning/data/2017/06/21/online-students-want-interaction-and-graduate-fast>

⁸⁰ Distance Education Enrollment Report. (2017). Retrieved from <https://onlinelearningsurvey.com/reports/digitallearningcompassenrollment2017info.pdf>

⁸¹ Rabin, M. (2018, September 26). Personal interview.

⁸² Rabin, M. (2018, September 26). Personal interview.

⁸³ Miller, T. (2018, October 1). Personal interview.

⁸⁴ Rabin, M. (2018, September 26). Personal interview.

⁸⁵ Rabin, M. (2018, September 26). Personal interview.

⁸⁶ WeWork and 2U, Inc. Announce Strategic Partnership to Enhance the Future of Work and Learning (2018). Retrieved from <https://2u.com/about/press/wework-and-2u-announce-partnership-to-enhance-the-future-of-work-and-learning/>

pharmaceutical companies may be leveraged to provide lab space. Finally, cooperative extension offices, which are already on-the-ground in all 100 counties and affiliated with NCSU, NC A&T and UNC Greensboro,⁸⁷ are physical spaces with experts and educational resources intended to economic prosperity, environmental stewardship and an improved quality of life.⁸⁸ Such centers are uniquely embedded in communities as learning centers and can be enhanced with physical spaces and technological infrastructures to support local learners in online degree programs.

For rural students, like Claire, expanding our online offerings and partnering with local businesses, community colleges, and extension offices can help students participate in an interactive learning community while getting their degree remotely.

Next steps

Form a task force at the NC System Level with a charge to:

- Develop a set of needs for supporting students with local partnerships, which can be used to identify appropriate partners
- Identify and describe opportunities in online programs that 1. Already require students to come to campus and 2. Would find benefit in having in-person learning opportunities for students.
- Identify businesses that may be interested in partnering with universities to provide local learner support through physical space, technological infrastructure, or lab access
- Conduct an analysis of current NC System & NC Community College integrations, as well as the current NC System and Cooperative Extension integrations for online offerings
- Evaluate the physical spaces and technological infrastructures in cooperative extension offices and community colleges for service proposed distance education enrollments from each county
- Investigate local partnerships in other state systems to determine which structures are most successful
- Develop a report for each NC System institution that describes a structure for potential local opportunities for online degree students in North Carolina

⁸⁷ NC State University website. <https://www.ces.ncsu.edu/local-county-center/>

⁸⁸ NC State University website. <https://www.ces.ncsu.edu/departments-partners/>



Recommendation: Investigate, pilot, and use adaptive learning systems

Expanded broadband access not only means these students can engage with content-rich online education, but also that they can engage with cloud-based adaptive learning systems.

Adaptive learning systems target one of the main challenges in public education: “the overwhelming challenge of teachers or faculty being responsible for accomplishing learning mastery among a demographically diverse set of students.”⁸⁹

They accomplish this by using AI to compare actions students take with large datasets (Big Data) to develop customized learning paths for students in real-time. While there are different approaches to designing adaptive learning systems (machine-based, advanced algorithm, rules-based, and decision-tree)⁹⁰, at a high level, adaptive learning systems all:

- Monitor student interactions and using large datasets combined with AI algorithms to deliver the most appropriate content and learning activities to students, based on prior performance and interactions with learning materials
- Respond to student interactions in real-time with individualized support
- Communicate progress and process back to faculty
- Generate reports through the use of tracking and analytics that provide institutions with information about what offerings are most appropriate for different types of students, while creating the ability to generate individualized student reports on competency attainment.

Adaptive learning systems combine adaptive content, adaptive assessment, and adaptive sequencing to generate a learning experience customized for each student⁹¹ in real-time.

Use of these systems can increase access and student success in the following ways:

⁸⁹ Pugliese, L. (2016). *Adaptive Learning Systems: Surviving the Storm*. Retrieved from <https://er.educause.edu/articles/2016/10/adaptive-learning-systems-surviving-the-storm>

⁹⁰ Pugliese, L. (2016). *Adaptive Learning Systems: Surviving the Storm*. Retrieved from <https://er.educause.edu/articles/2016/10/adaptive-learning-systems-surviving-the-storm>

⁹¹ EdSurge Website. <https://www.edsurge.com/research/special-reports/adaptive-learning/definition>

NC System Strategic Plan Goal	Characteristic of Adaptive Learning System
Access	<ul style="list-style-type: none"> • “Adaptive systems conform to individual students' varied lifestyles through the use of asynchronous components – do not require as much time or location coordination as traditional learning models. • Can support coursework outside traditional term and degree structure
Student Success	<ul style="list-style-type: none"> • Executed effectively, the cost efficiencies in automated feedback and remediation without formal instructor intervention have shown major improvements in student learning. • Regulating course content degree of difficulty results in better course engagement and progression. • Students own their learning journey: real-time response to their ongoing coursework provides detailed feedback for self-mediation. • Adaptive systems encourage student ownership of their learning through automated feedback cycles prompting them to take action and advance independently of the class instructor. • Faculty receive data with insights into individual students' needs. Adaptive systems can provide a level of automation allowing faculty to better allocate time to students who need remediation. • The technology actively uses research about how people learn. Correctly developed, adaptive systems reveal how individual students learn. • Adaptive systems empower faculty. Rich data analysis of student progression enables faculty to continually improve course design. • Traditional assessment methods inform both faculty and students too late in the learning cycle. Using timely and comprehensive data-driven feedback, adaptive systems can inform in real time.”⁹²

It also promotes faculty efficiencies, potentially allowing faculty to better balance their teaching and research loads and/or creating space for teaching faculty that hold a different role in the university ecosystem than traditional faculty:

- “Automated processes of student assessment and predictive analysis result in significant faculty time efficiencies.
- Adaptive systems address the fundamentally different levels of prior knowledge, as well as course content progression based on students' skill and outcomes mastery measurement, decreasing faculty load in teaching and remediation to teaching and facilitating.”⁹³

Students aren't one-size fits all. Some who are first generation students, like Phyllis, may need extra time, while others, who work in a fast-paced teams-based environment, like Jessica, need constant change, interaction, and immediate feedback to stay engaged. Returning students, like Mark, may come with prior knowledge and need to move quickly past material they've already mastered to stay engaged.

⁹² Pugliese, L. (2016). *Adaptive Learning Systems: Surviving the Storm*. Retrieved from <https://er.educause.edu/articles/2016/10/adaptive-learning-systems-surviving-the-storm>

⁹³ Pugliese, L. (2016). *Adaptive Learning Systems: Surviving the Storm*. Retrieved from <https://er.educause.edu/articles/2016/10/adaptive-learning-systems-surviving-the-storm>

Adaptive learning gives students a personalized learning experience by delivering content curated in real-time and giving their instructors the most effective information for helping them master the material outside the constraints of a traditional one-size fits all lecture-based educational model.

Limitations of adaptive learning

However, adaptive learning systems are still first-generation and, in order for their potential to be maximized, there is an ecosystem of technology, infrastructure, standards and process systems that need to be considered,⁹⁴ as described in the graphic below.

⁹⁴ EdSurge Website. <https://www.edsurge.com/research/special-reports/adaptive-learning/>

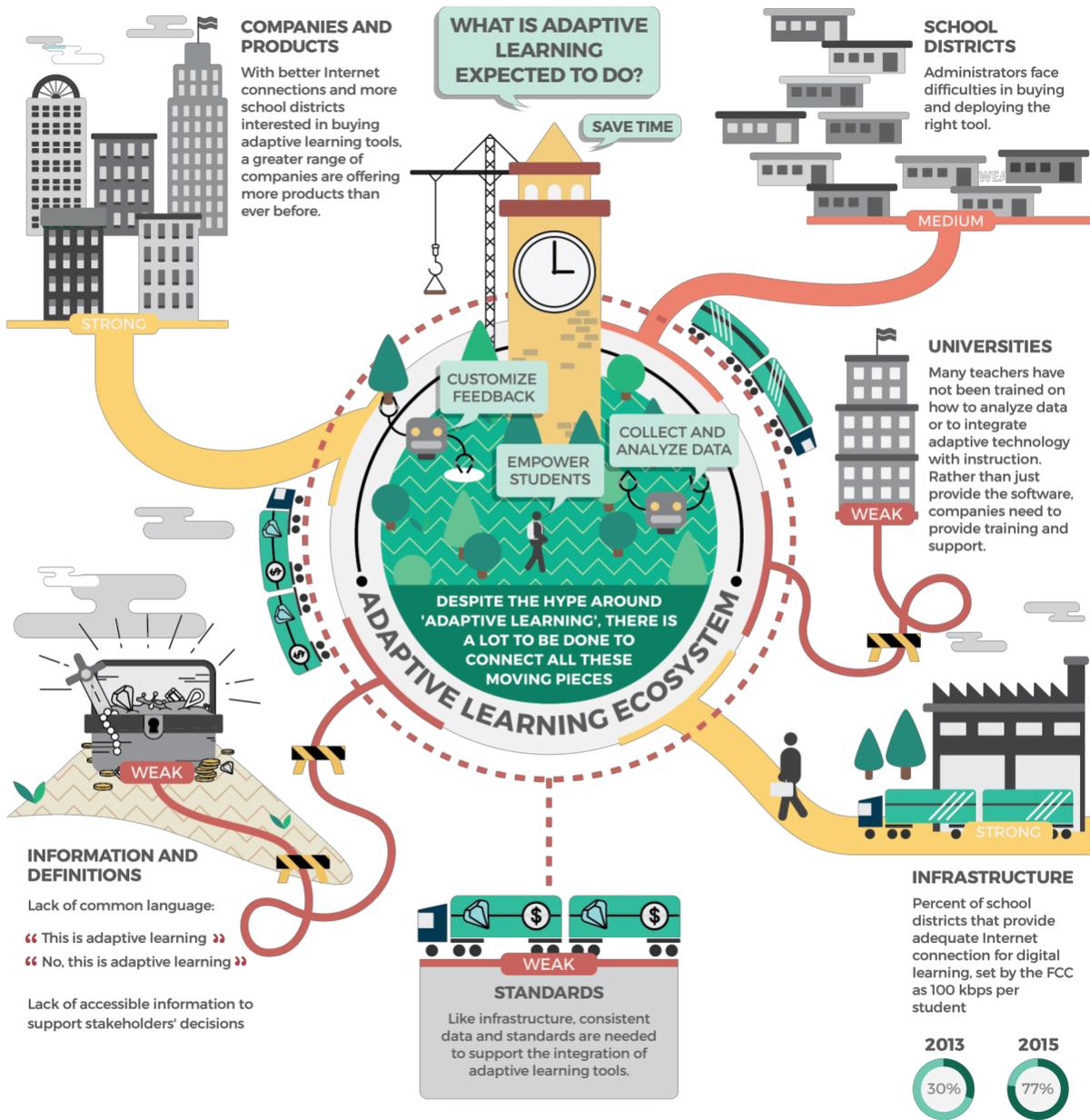


Figure 7. What is Adaptive Learning Expected to Do?. Retrieved from http://www.pewresearch.org/fact-tank/2017/01/12/evolution-of-technology/ft_17-01-10_internetfactsheets/

There are a variety of first-generation systems that are being piloted in K-12 and some higher-ed institutions, such as Smart Sparrow, which is being adopted by the UNC School of Nursing, Dreambox Learning, and Knewton’s Alta.

⁹⁵ What is Adaptive Learning Expected to Do?. Retrieved from http://www.pewresearch.org/fact-tank/2017/01/12/evolution-of-technology/ft_17-01-10_internetfactsheets/

Implementation is complex; there is a strong need for infrastructure around adaptive learning so it coordinates with other campus systems – which is why we’re recommended starting with research and a pilot before using an adaptive learning system.

Next steps:

Form a task force to evaluate and make recommendations for a 5-year plan for implementing adaptive learning at the UNC system

- Investigate the state of adaptive learning
- Assess needs, based on technology and demographic influences in 2028
- Identify infrastructure and process roadblocks
- Evaluate systems for integration with LMSes and other data systems on-campus
- Build and run a pilot program, with established metrics and analytics, and selected vendor
- Evaluate pilot fo generate recommendations for adaption/wider implementation