



LESSON PLAN: Preparing Students for Jobs of the Future

We are living through what some are calling “the fourth industrial revolution.” We are experiencing an unprecedented rate of technology adoption across the entire economy. Globally, the scale of the potential disruption is huge, and the time frame short. Innovation is driving new technologies that are already revolutionizing daily life. We are all familiar with self-service check out at the grocery store, but in ten years self-driving vehicles may be just as common. According to the “FutureWork Disruption Index for North Carolina,” automation especially threatens lower-skill jobs, but jobs at all levels will be affected across our state. Automation and tech-enabled offshoring may alter or erase 2.4 million of our state’s 5 million jobs by 2040. Jobs that don’t succumb to automation will likely require workers to use particular skills and new technologies in their work.

Students contemplating potential careers and career paths would do well to understand how technological change is fundamentally reshaping—and even eliminating—occupations across the economy.

While youth are overwhelmingly optimistic about the future, most (86%) believe that technology is creating jobs as opposed to destroying them. However, very few young people have a good grasp of the forces shaping the economy and how their jobs might change. This exercise is designed to provide students with a better understanding of concepts like automation, and help them to gain insight into how the world of work might change in the future. We believe that with better information, youth can make more informed decisions about their educational choices and their career paths.

This lesson plan is aimed at teachers and anyone who works with young people. It’s a step-by-step outline of a 70-minute interactive conversation. We offer to you our insights gained from engaging diverse groups of young people, from 13 years old to community college-aged students, from across the state of North Carolina.

ESSENTIAL QUESTION: *How are forces like automation and geography impacting future jobs in North Carolina?*

LEARNING OUTCOMES

- Students will gain an understanding of how automation, geography and education are impacting the future of jobs in our state.



TEACHER PLANNING

Materials Needed

- Tablets OR computers with internet access
- Teacher computer with LCD projector
- White board or other writing surface for class display

Time Required for Lesson

- Opening Activity (10 minutes)
- Main Activity #1 (30 minutes)
- Main Activity #2 (20 minutes)
- Closing (10 minutes)

ACTIVITIES

Opening Activity (10 minutes)

1. Introduce the lesson plan topic with a series of questions about specific types of technologies (and show related videos)
 - a. Suggested opener: “How many of you have seen the Terminator movies? What are they about? (answer: how technology is taking over the world)
 - b. Who has heard of self-driving cars? (they are already on the streets; you can buy one today with enough money) Show at least the first minute of the video of “**Grandmother freaking out**” (provides humor while demonstrating the technology; also illustrates that new technologies can seem frightening...or cool... depending on your point of view)
 - c. How many of you have heard of Domino’s pizza? Of pizza being delivered to your house? Or pizza delivered by a robot? (show “**Dominos Delivery by a Robot**” video; this is being tried in New Zealand and Australia. Coming soon to you????)
 - d. How many of you, or someone in your family, has gotten something from Amazon? Here’s one way Amazon is using robots to ship good to you faster (show “**Meet the Robots Making Amazon Even Faster**”).
 - e. What are implications for jobs and for workers of this new technology? Let’s spend this lesson looking at the question of how technology is impacting jobs.

Note: Feel free to identify your own interesting short video snippets on new technologies to spark the interests of students.



Main Activity #1: Which jobs are at risk for automation? (30 minutes)

1. Ask each student to write down what he or she thinks will be his/her future job.
2. Use the LCD projector to display the National Public Radio website, [Will Your Job be Done by a Machine?](#)
3. Ask students to find their job (or occupation) from the list provided, first using the left column (general occupational categories) and then the more specific ones with the right column. Ask who has the highest chance of automation and who has the lowest (write sample of highest/lowest occupations and percentages on board)
4. Ask students to find jobs with the highest probability of automation (greater than 95%) and those with lowest (under 5%). To save time, the class could be divided in half with one group looking for lowest and the other looking for highest probabilities. Ask for and write samples of each on board, augmenting what is already there.
5. Discuss with students what makes a job harder or easier to automate (the webpage mentions several factors and others are included with them below)

Characteristics of Jobs and Likelihood of Automation

More Susceptible to Automation	Less Susceptible to Automation
Routinized tasks	More Perception and Manipulation <ul style="list-style-type: none"> ● Finger dexterity ● Manual dexterity ● Working in small or awkward spaces
Little creativity or “thinking on your feet”	More Creative Intelligence <ul style="list-style-type: none"> ● Creative or original ideas ● Adaptive thinking and problem solving (“clever solutions”)
Little social intelligence	More Social intelligence <ul style="list-style-type: none"> ● Social perceptiveness ● Negotiation ● Persuasion ● Assisting and caring for others (coworkers, customers, patients)



6. Reflect on the videos shown earlier. What is the impact of technology on the people who have the jobs, like delivering pizza, driving a taxi, or filling an Amazon order?
 - For some technologies, you might see workers losing their jobs (like driving taxis and delivery vehicles); for others (like in the Amazon video), you might see technology making workers more efficient/able to do more and do it more quickly.
 - Technologies like these are changing many different types of jobs. As you think about what type of job you want, be sure to ask the question about the impact of technology – is it taking jobs or is it making workers more efficient? And what skills and technologies do you need to learn to be effective in the job you want?

Note: Jobs with characteristics in the right-hand column are currently less susceptible to automation due to computerization challenges. To the extent these challenges are solved in the future, and there is ongoing research in all of these areas, the results will change.

Main Activity #2: *How is geography and education impacting future jobs?*
(20 minutes)

Economies and the jobs they contain are heavily influenced by the mix of assets present, including the prevalence of specific industries, of workers with certain skills, the presence of colleges and universities (for skilled graduates as well as research that leads to jobs), natural resources (like beaches, mountains or golf courses), and roads, ports and other physical infrastructure.

For today's students preparing for tomorrow's jobs, it is important to understand the role that geography plays in determining the types of jobs to be found in the years to come and the wages they will pay. The impacts of technology discussed above interact with the specific job mixes (and their related educational requirements) found in each region of our state to collectively influence future jobs opportunities.

1. Use the LCD projector to show students how to navigate to the NC Department of Commerce's "[North Carolina Star Jobs](#)" webpage.
2. Ask the students to scroll down to the map of North Carolina and choose a link below the map corresponding to one of the eight areas (called Prosperity Zones) of the state. This will bring up a "star jobs" report for that region. It lists, by minimum education typically required, the best jobs (by wages and number expected to be available) that are projected in that region through 2022. The numbers of expected open/vacant positions each year is also listed along with a typical wage.



3. Ask students to study the report and consider the following questions. Then discuss.

- a. Is the job you want listed? If so, how much does it pay? (hourly rates can be multiplied by 2080 to get an expected annual salary; this is 40 hours/week for 52 weeks)
- b. What are the sectors of the economy that show up the most, regardless of educational level? (hint: health care, information technology, general business are the big ones)
- c. Which are the highest paying jobs and which are the lowest paying jobs?
- d. How many of the best paying and lowest paying jobs are there in each region? (hint: depends on the size of the economies, the regions with the Triangle, Triad and Charlotte will have the most openings)
- e. What might explain why some jobs pay the most and others the least? (hint: education level and skill mix (both the ability to use technology to successfully do the job and the types of skills listed in activity #1. Caveat: the skills that resist automation, such as caring for others, do not always guarantee a higher wage.)

Closing (10 minutes)

1. Ask the students what they learned from these two activities about the impact of automation, geography, and education/skills on future jobs.
2. Did this discussion cause them to rethink or reinforce their future work plans?
3. What are their concerns, fears, or hope for the future?
4. Close by noting where students can go for additional information about careers and career pathways. (note: answer depends on resources available to the group, such as a career or guidance counselor if done in a school setting. Other resources listed below)

MODIFICATIONS/OPTIONAL EXTENSIONS

- Activity #2: Divide the class into smaller groups, assigning a region to each group and have the groups report out for their region the answers to questions 3(B) to 3(d).
- Add a Local Employer: This lesson is significantly enhanced by integrating a local employer. This can be done by inviting a guest speaker or making a class visit. Alternatively, it can be done by a teacher presentation if the teacher has first-hand experience with the employer. An overview of the company should be given and then the following should be addressed:
 - What types of jobs are there in the local firm?



- How is automation impacting these jobs (e.g., replacing workers or asking them to do new things with technology)?
- What skills do workers need to be successful in the different jobs?
- What types of positions will you be hiring...and not hiring in the future (and why)?
- What advice do you have for the students as they think about how to be successful in their future careers?

LEARN MORE

[“What Jobs will the Robots Take?”](#) The Atlantic, Jan. 14, 2014.

[“The Future of Jobs: The onrushing wave.”](#) The Economist, 1/18/14, pp. 1-7.

[FutureWork Disruption Index](#), Institute for Emerging Issues. 2016. Measures the potential impact of automation on jobs and wages across North Carolina.

Links to [resources on the future of work](#), Institute for Emerging Issues. 2016.

[Career and Career Pathways Information for North Carolina](#)

[College Foundation of NC](#) (CFNC) offers a wide range of college and career planning resources.

[NC Works \(NC Department of Commerce\)](#) – offers career planning tools and resources, including matching skills, interests and values to careers and information about occupations, related skills, career pathways, wages, and job outlook;