



Emerging Talent: Rethinking Higher Education for the Fourth Industrial Revolution

Jacob Feldgoise

Carnegie Mellon University

Advocacy, Policy, and Practice

1. ISSUE & IMPORTANCE

Emerging technologies such as artificial intelligence, blockchain, cryptocurrency and 5G/6G will reshape our education system by 2030. It is essential that governments and the private sector collaborate to make sure that the economic transition to these technologies doesn't exacerbate existing socioeconomic divides in the United States. In order to prevent a widening class divide, the education sector will need to evolve to match the skills required for newly emerging jobs – including digital literacy and soft skills – and must ensure that students across the socioeconomic spectrum receive a competitive education in these high-demand skills. Specifically, individuals will need software development and data science skills to compete for the best jobs in the United States, according to Glassdoor.¹

The outflow of faculty from universities with top-tier computer science programs to high-paying tech giants has ironically constricted the very talent pipelines that those same companies rely on.² Furthermore, even after recruiting from top-tier private universities, companies working in emerging technologies industries still struggle to fill positions for experts in artificial intelligence (statistics and machine learning). A 2017 report from Tencent, the Chinese artificial intelligence giant, found that there were only about 300,000 AI professionals worldwide, but millions of jobs remained unfilled.³

These issues certainly apply to Pittsburgh, a burgeoning hub of artificial intelligence startups and tech giants. Many of Pittsburgh's homegrown AI startups such as Duolingo, Astrobotic, and Aurora Innovation are experiencing the same talent shortages as the city's resident tech giants of Uber, Google, and Facebook. This dynamic presents an unparalleled opportunity to shape Pittsburgh's workforce of the future with socioeconomic equality in mind.

¹ "Best Jobs in America." Glassdoor. Accessed May 4, 2020. https://www.glassdoor.com/List/Best-Jobs-in-America-LST_KQ0,20.htm.

² This finding is documented in a forthcoming report from the Center for Security and Emerging Technology (CSET) focused on U.S. domestic talent shortages in Artificial Intelligence.

³ "2017 White Paper on Global Artificial Intelligence Talent (2017全球人工智能人才白皮书)." Tencent Research Institute, 2017. https://www.tisi.org/Public/Uploads/file/20171201/20171201151555_24517.pdf.

2. POLICY PROPOSAL

I present an innovative policy solution (known as “**Emerging Talent**”) to address these issues in the sphere of tertiary education. I propose a local collaboration between technology companies, the **Community College of Allegheny County (CCAC)**, and the Allegheny County Executive. Similar partnerships already exist between colleges and individual companies. For example, Shell develops STEM education partnerships with universities around the world; Shell can be sure that talented students emerging from these programs have the emerging technologies skill-set that the company is looking for. However, existing programs have two major drawbacks: (1) they often fail to adequately protect participants, and (2) they don’t leverage the convergent demand for emerging technologies talent across an entire sector.

The Allegheny County Executive should facilitate a tertiary educational program between groups of talent-constrained technology companies and CCAC. With oversight from the Allegheny County Executive, the chosen set of companies would collectively fund a tuition-free program in an emerging technology field for participating students, who would be contractually obligated to work for their sponsor after graduation. The program would run as follows:

1. Allegheny County Executive identifies a core group of tech giants to fund the program.
2. These core companies work with the relevant CCAC department(s) to develop a curriculum and set tuition for the program (which the companies will pay).
3. Once the core companies, CCAC, and the Allegheny County Executive all sign off on the program, the Allegheny County Executive will invite ancillary companies (as well as the core companies) to participate in the program by purchasing spots for students. Every spot that a company pays for will be filled with a student who is obligated to work for that same company after graduation. At this point, the size of the program is set.
4. Next, the companies and CCAC will set up the program (e.g. locate/build classroom space) and advertise the program internationally (the burden of advertisement will mainly fall on the companies).

5. Admissions officers will interview and select participants based on their academic excellence and ability to pay; officers will prioritize students and families with the least ability to pay.
6. After the first cohort of students is enrolled in the program, officials from the Office of the Allegheny County Executive will conduct periodic reviews (e.g. sitting in classes and interviewing students) to ensure that students and educators (CCAC faculty and industry researchers) are satisfied with the program.
7. The program will be adjusted based on feedback.
8. Following the program, participants would be obligated to work for their sponsor company for a period of time less than or equal to the length of their academic program.

The initial framework for this proposal was developed at “Dell PolicyHack at Thrival 2019”, where teams from all walks of life had 60 minutes to design solutions to policy challenges and present them to a team of judges, including Mayor Peduto, to determine the most viable idea.⁴ The teams hacked issues highlighted in Dell’s Realizing 2030 Report, which explores how emerging technologies will reshape our economy, work and lives over the next decade.⁵ Our PolicyHack team – focused on the future of education – presented the winning proposal.

3. FEASIBILITY

Emerging Talent envisions a new kind of tertiary education program to help students, companies, and community colleges navigate the future of work. The proposed system creates strong incentives for all participating parties: companies, students, and CCAC alike.

⁴ “DELL POLICYHACK AT THRIVAL.” Eventbrite. Accessed May 4, 2020. <https://www.eventbrite.com/e/dell-policyhack-at-thrival-tickets-71434204629#>.

⁵ “Dell Realizing 2030 Report.” Realizing 2030. Dell Technologies US. Accessed May 4, 2020. <https://www.delltechnologies.com/en-us/perspectives/realizing-2030.htm>.

Emerging Talent will help community colleges (such as CCAC) take advantage of the world-class computer science and engineering talent available to tech giants. Participating companies would lease office space from CCAC (or pay for a new building) to house research and classes. This would bring leading researchers at tech giants into an ecosystem with CCAC's engineering and computer science departments – creating research and employment opportunities for CCAC students and faculty who *aren't* affiliated with the program. Furthermore, this program would bring revenue and prestige to CCAC.

The Emerging Talent program will provide participating students with a world-class, tuition-free STEM education in emerging technologies, as well as guaranteed employment following the conclusion of the program. Companies would work with the relevant CCAC department to create a tailored curriculum that meets their talent needs and provides participating students with a sufficiently well-rounded education; students would still be required to fulfill a modified version of CCAC's basic skills and general education requirements,⁶ exposing them to disciplines outside of their specialization.

Furthermore, students will be protected by a cap on the time of mandatory employment as well as by the Allegheny County Executive. Students can only be obligated to work for their sponsor company for an amount of time equivalent to the duration of their education. For example, if a company works with CCAC to put participating students through a two-year associates degree program, those students would only be obligated to work for a maximum of two years; this requirement could also be waived by the company, at no cost to the student.

Finally, the Emerging Talent program incentivizes company participation by placing them at the receiving end of a bespoke talent pipeline; the program will enable companies to better fill talent gaps without breaking the bank. By working as a coalition, companies with similar talent needs can circumvent the logistical barriers to entry that would prevent many companies from starting

⁶ "Understanding Academic Programs." Community College of Allegheny. Accessed May 4, 2020. <https://catalog.ccac.edu/content.php?catoid=7&navoid=926>.

similar programs by themselves; furthermore, the support of the Allegheny County Executive will help limit the chance of regulatory snares.

4. HISTORY

The success of the Emerging Talent program relies on a solid understanding of the role of big tech companies in the greater Pittsburgh area. Over the past decade, Pittsburgh has become a home to big tech companies, but these companies have also exacerbated socioeconomic inequalities by insufficiently contributing to their community. Many Pittsburgh residents aren't experiencing the benefits that tech companies claimed to create. Thomas Holland, who has run a t-shirt and ball cap printing shop in East Liberty (a Pittsburgh neighborhood) for the past 40 years argues that big tech has only brought bring higher costs, not a better life. He feels that big tech companies haven't created the surge in income that many Pittsburgh residents were expecting: "What wealth? We haven't experienced that yet."⁷ Big tech companies in Pittsburgh also work primarily with students and faculty at Carnegie Mellon University, not with students and faculty at CCAC.

For the Emerging Talent program to succeed, I will need to ensure that it is seen as a solution – not as part of the problem. I will need to convince residents that this program will create amazing opportunities for participating students and that the Allegheny County Executive will actively ensure that big tech companies don't take advantage of the students. Furthermore, I'll need to show residents that the Emerging Talent program will not pull resources away from the Allegheny County Executive that would otherwise help local residents.

5. ADVOCACY PLAN

My advocacy plan for this program will proceed along two parallel tracks:

⁷ Somerville, Heather. "A Tech Boom in Pittsburgh Brings Hope and Angst." Reuters. Thomson Reuters, October 12, 2018. <https://www.reuters.com/article/us-pittsburgh-tech/a-tech-boom-in-pittsburgh-brings-hope-and-angst-idUSKCN1MM13Y>.

Grassroots

My grassroots advocacy strategy will focus on soliciting feedback and support from three key populations: CCAC students, CCAC faculty, and Allegheny County community members. Any other these groups could easily block my program if they had serious objections. The purpose of this grassroots advocacy strategy is to identify potential roadblocks as early as possible and make policy changes to address those objections; basically, this process will make Emerging Talent as robust as possible.

I will reach out to a representative sample from each of the aforementioned communities to ensure that my advocacy strategy touches all relevant components of each community. I will interview each of these individuals – aiming for 75-100 interviews. First, I'll pitch the Emerging Talent program. I'll clarify that the program is a work-in-progress and then solicit the interviewee's impressions and feedback (both on the program and my pitch).

Once I've completed the initial round of interviews and made improvements to the program based on the interviewees' feedback, I'll schedule larger "town halls" to build broad community support; this stage of the grassroots advocacy strategy will proceed after I've built initial support with the Allegheny County Council-members via my professional and government advocacy strategy. During these meetings, I will answer questions about the Emerging Talent program, and stress above all else the benefits that the program will generate for CCAC, participating students, and Allegheny County as a whole.

Professional & Government

My professional and government advocacy strategy will attempt to build support among relevant school administrations, governmental offices, and businesses. This part of my advocacy strategy will proceed after the feedback-gathering stage of my grassroots advocacy strategy.

First, I will need to secure support from the CCAC administration. To do so, I will pitch my Emerging Talent program to the President of CCAC, Dr. Quintin Bullock. I will emphasize the benefits that the program would generate, both for CCAC and participating students. Furthermore, I will present Dr. Bullock with a petition of CCAC students and faculty who support the program; this will help show that the Emerging Talents program already has support from the CCAC community.

Since the Emerging Talent program will operate under supervision of the Allegheny County Executive, I will need support from that office. I will pitch the program to Rich Fitzgerald, the incumbent Allegheny County Executive. Mr. Fitzgerald's biggest concern will likely be that his office would have to divert significant resources to perform oversight on the Emerging Talent program. I'd assure him that oversight costs will be paid by participating companies. I will expand this element of my advocacy plan to also encompass Allegheny County Council-members. If I can earn the support of a few council-members, they can help me schedule town halls and better pitch Emerging Talent to the Allegheny County community.

It is also essential that I build support among the tech companies that would purchase seats for participants in the Emerging Talent program. This includes big tech companies that already have offices in Pittsburgh (e.g. Uber, Google, and Facebook) as well as SMEs in Allegheny County that are facing emerging tech talent shortages (e.g. Duolingo, Astrobotic, and Aurora Innovation). I will secure meetings with company executives and pitch the Emerging Talent program to them.

Finally, I will communicate with the administrations at the University of Pittsburgh and Carnegie Mellon University to ensure that the program doesn't catch them off guard. Since Emerging Talent doesn't directly compete with the established relationships between tech companies and those schools, I don't expect much opposition on this front.

6. CONCLUSION

The Emerging Talent program presents an innovative policy solution to address issues of socioeconomic inequality and emerging technology talent shortages. Emerging Talent envisions a new kind of tertiary education program to help students, companies, and community colleges navigate the future of work. With oversight from the Allegheny County Executive, the chosen set of companies would collectively fund a tuition-free program in an emerging technology field for participating students, who would be contractually obligated to work for their sponsor after graduation.

The Emerging Talent program would benefit students, CCAC, and participating tech companies. Students would receive a world-class, tuition-free STEM education in emerging technologies, as well as guaranteed employment following the conclusion of the program. The program would help CCAC take advantage of the world-class computer science and engineering talent available to tech giants. Finally, the program will enable companies to better meet their talent needs in emerging technologies, without breaking the bank.

In order for this program to succeed, I need to reckon with Pittsburgh residents' dissatisfaction about the behavior of tech companies. I propose a grassroots advocacy strategy that focuses on building support among local Allegheny County residents as well as CCAC students and faculty. I propose a parallel professional and government advocacy strategy to build support with the Allegheny County Council, school administrations, and companies.