



University of
Pittsburgh

Joseph M. Katz
Graduate School of Business

KATZ Super Analytics Challenge

IMPACT REPORT

The 2021 Super Analytics Challenge
Focused on Addressing Homelessness

*Organized by the Joseph M. Katz Graduate School of Business, University of Pittsburgh
In collaboration with the Allegheny County (Pennsylvania) Department of Human Services*

Report produced by the Pittsburgh Technology Council and the University of Pittsburgh

Making an **IMPACT** Outside the Classroom

At the University of Pittsburgh Joseph M. Katz Graduate School of Business, we continually reassess our priorities to develop new ways to deliver key student experiences. In 2020, the coronavirus pandemic forced us to implement an innovative approach to the foundation of our graduate programs—learning by doing.

It's become increasingly clear that our students are anxious to make an impact outside of the classroom, and it is our role to diligently train them to manage during times of change and uncertainty. Katz's mission to prepare students to be catalysts for change is more important than ever, requiring us to prioritize our approach to integrated learning and embrace our purpose of educating leaders who positively impact humanity.

To create enhanced integrated learning opportunities for students, we launched the first-ever Super Analytics Challenge by partnering with the Allegheny County Department of Human Services (DHS) to examine complex scenarios that either led people and families into becoming homeless, or factors which may prevent homelessness.

Twenty three graduate students from across the University of Pittsburgh teamed up to participate in this three-phase, hackathon-style competition. Throughout this report, you'll get to know them and their projects, as well as gain insight into the impetus for creating this challenge, how it was executed, the multiple stakeholders who provided invaluable guidance, and the inventive solutions that are a hallmark of a Pitt Business education.

While the immediate outcomes and benefits are known and addressed throughout this report, it's important to note that the impact of the Super Analytics Challenge is just beginning—we'll have new updates and ideas to share as we truly unpack the residual ramifications in the long term. As we continue to understand the influence of the inaugural Super Analytic Challenge, Pitt Business commits itself to ensuring our graduate students are armed with the knowledge to serve as catalysts for change.



Sara B. Moeller, Associate Dean for Graduate Programs and Executive Education at the University of Pittsburgh's Joseph M. Katz Graduate School of Business.

It's become increasingly clear that our students are anxious to make an impact outside of the classroom...

Challenge Construct

Recognizing the importance of leveraging business skills to positively impact critical social issues, the University of Pittsburgh Joseph M. Katz Graduate School of Business (Katz) developed and launched its first-ever Super Analytics Challenge, a new community-based initiative.

The 2021 challenge addressed the complex issue of homelessness in the Pittsburgh community. Katz partnered with the Allegheny County Department of Human Services (DHS) to examine scenarios that either led people and families into becoming homeless, or factors which may prevent homelessness.

By harnessing the unique skills, diverse perspectives, and energy of graduate students, the Challenge sought to catalyze social impact through novel data-driven solutions and insights that could serve the homeless community. This integrated learning opportunity was designed to sharpen students' data analytics skills and strategic consulting acumen. Skill development, and an emphasis on analytics in particular, supports the workforce of tomorrow by aptly training talent poised to enter the labor market.

A Complex Issue – A Wicked Problem

The many contributing factors of homelessness, such as physical and mental health, the affordable housing supply, economic conditions, and the intersection of the judicial system, as well as the wide availability of published data and research, presented an urgent opportunity to provide meaningful insights and proposals for targeted mitigation efforts.

Selecting homelessness as the topic also added layers of complexity to the Challenge. This initiative intentionally delved into an issue in which there are no easy answers, as graduate students must become proficient in dealing with uncertainty and considering a problem from multiple perspectives.

The topic of homelessness functioned as a 'north star' for all contributors and participants. Given the issue's urgency and real-life consequences, homelessness served as a directional waypoint to rally community support. The passion around work-

ing towards solving homelessness led to corporations, associations, local government, and nonprofit organizations providing extensive expertise and resources to ensure the Challenge's success.

Intended Impact

This report examines the outcomes, in terms of benefits, from the Challenge by:

1. Summarizing the solution ideas generated by the student teams, shared with the Allegheny County Department of Human Services.
2. Reviewing student learning outcomes from the Challenge – uncovering associated value from students' perspectives through supporting a community-based Challenge.
3. Examining the value-drivers for community partners in collaborating in this Challenge.

Benefit outcomes were summarized based on surveys, interviews, and focus groups from students and partners involved in this Challenge.

Timing, Participants & Construct

- Dates: March 5th to March 26th, 2021
- 5 Teams consisting of 23 student participants
- Challenge Completed in 3 Phases: (1) Problem Framing, (2) Solution Design/Data Modeling, & (3) Solution Presentation

Review the Challenge Case for more details on the homelessness briefing, student objectives, data sources, and judging rubrics at: <https://www.katz.business.pitt.edu/2021-katz-super-analytics-challenge>

IN THIS REPORT	3. Community & Partner Roles	5. Student Teams + Solution Summaries	8. Impact Summary	11. Learn More and Acknowledgements
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COMMUNITY PARTNERS & ROLES

A Community-based Initiative

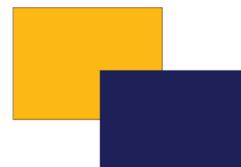
Katz brought together a network of professionals to support this community-based initiative. Given the topic of homelessness and the necessity of leveraging data analytics, experts were strategically identified based on their technical abilities complemented by extensive experience in these functional domains. As a goal of the Challenge was to innovate solutions, we took care to coalesce individuals steeped with knowledge and diverse perspectives across multifaceted industries.

Advisory Committee

Katz also coordinated an Advisory Committee to serve as the nexus for this initiative, as they guided the construct of the Challenge, the refinement of the phases and judging rubrics ([see the Challenge Case](#)), and rallied additional experts and resources from their respective organizations to support the Challenge. They themselves served as Judges and provided briefings on the homelessness topic for all teams.

Executive Coaches

Each team was assigned an Executive Coach who periodically checked in on the students' progress, providing them additional insights and recommending approaches to the Challenge. (See the following section on Student Teams & Solutions for a listing of the Executive Coaches.)



Advisory Committee Members



Pamela Peele, Chief Analytics Officer, UPMC Health Plan/UPMC Enterprises



Richard Clarke, Chief Analytics Officer, Highmark Health



Albrecht Powell, Managing Director-Digital Data & Analytics, Accenture



Manpreet Saini, Practice Head, Analytics & Insight, North America, SAP



Jack Peterson, Director, Strategic Relations, National Association of Counties



Audrey Russo, CEO, Pittsburgh Technology Council



Andy Halfhill, Manager, Homeless/Housing Analytics, Allegheny County (PA), Department of Human Services



Sara Moeller, Associate Dean, University of Pittsburgh (Katz)



Andy Hannah, Adjunct Professor, University of Pittsburgh



Christopher Barlow, Director, Corporate Engagement & Career Management, University of Pittsburgh (Katz)

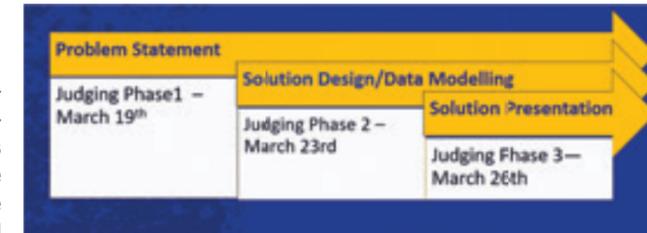
Experts + Instructors

Embedded within the pre-Challenge preparation were briefings and workshops intended to provide some common understanding to a diverse group of students in different phases of their personal and professional growth. The Challenge construct was intentionally complex in order to encourage students to push beyond their comfort zones in terms of skill development while also stimulating them to understand how social issues intersect with business education. Furthermore, these sessions intended to bolster students' abilities to provide meaningful, tangible solutions to an urgent crisis in the local and global community.

To deep dive into the cross section of homelessness and advanced data analytics, an ensemble of professionals briefed student teams through short, crash course-type videos and also offered 'open office hours' to answer specific questions. Critical to ensuring students were prepared for the Challenge's complexity were sharing knowledge beyond data, outlining tips for summarizing insights through effective storytelling, or providing digestible overviews of the intricacies of housing policies that support vulnerable populations.

In addition to the resource library of topic briefings, students participated in pre-Challenge professional development workshops on subjects ranging from strategy consulting principles to data modeling and mining, to team building. Instructors of these sessions included:

- Sandra Douglas, Director of Strategic Initiatives, Katz Graduate School of Business
- Bharat Dash, Sr. Technical Project Manager, SDLC Partners
- Claye Greene, CEO, TechBlue Inc., & Entrepreneur-in-Residence, Pitt Business
- Michael Hamilton, Assistant Professor, Katz Graduate School of Business
- Leon Valdes, Assistant Professor, Katz Graduate School of Business



Judges

The Challenge included three judging rounds to provide students with phased feedback reflective of the Challenge construct. Judges evaluated students' efforts of framing a problem to develop a High Impact Question (HIQ) of interest, generating a data solution or model, and proposing a realistic solution that could be implemented by Allegheny County. Teams prepared short, recorded presentations for each phase, which were followed by Q&A sessions with each group of judges. Following the critiques, teams were encouraged to be agile in their response to the judges' input in preparation for the next Challenge phase. At any phase prior to final judging, students were encouraged to update their HIQ or data approach in order to better serve DHS and the homeless population.

In addition to a number of Advisory Committee members serving as judges, Katz called upon supplemental experts to judge and provide support in feedback sessions. They were:

- Jane Downing, Sr. Program Officer, The Pittsburgh Foundation
- Nick Cotter, Data Analyst, Allegheny County DHS
- Christine Kretz, VP of Programs & Partnerships, International Space Station, U.S. National Laboratory
- Katy Collins, Chief Analytics Officer, Allegheny County DHS
- Kim Snyder, Principle, New Normal Advisors

Subject Matter Experts:

- Dan Lavalley, Director of Social Impact, UPMC Health Plan
- Joni Schwager, Executive Director, Staunton Farm Foundation
- Brian Knight, Community Engagement Manager, Homeless Children's Education Fund

Methods Experts:

- Philippe Mouloudj, Senior Technical Support Specialist, SAP
- Rebecca Schorr, Sr. Research Statistician Care Analytics, Highmark
- Kelly J. Shields, PhD., Sr. Research Data Scientist, Highmark

STUDENT + SOLUTION TEAMS SUMMARIES

Student Teams & Their Solutions

Graduate students from across the University of Pittsburgh applied to be a part of the Super Analytics Challenge. Students were selected based on a combination of their data analytics skills, work experience, leadership abilities, and domain knowledge, plus eagerness to support the topic.

The five teams delivered solutions ranging from providing homeless individuals with academic resources, improving access to sustainable housing, increasing efficiency of rapid rehousing processes, and optimizing existing resources through a predictive algorithm.

Students were then strategically paired on teams by Katz staff and faculty to balance their skills, experience, and backgrounds. The Executive Coaches were randomly assigned to the teams.

An overview of the team members, their executive coach, and a brief summary of each solution can be reviewed in the below table.

Team 1

Students	Exec Coach	Solution Summary
<ul style="list-style-type: none"> • Matt Abramson • Yifeng Chen • Gianna Donati • Sree Ram Avinash Maddikonda • Chun Zhao 	Curren Katz, Director, Data Science & R&D, Highmark Health	To solve homelessness, demand for services must be reduced. Proposed models provided insights for the County to reduce the demand for homeless services by decreasing homeless rates. This solution wisely considered the need to utilize important adjacent data and identify 'near misses' to develop a more complete picture of those at risk of experiencing homelessness.

Team 2

Students	Exec Coach	Solution Summary
<ul style="list-style-type: none"> • Muntasir Nayem Chowdhury • Marci Davis • Justin Alicea • Chahee Park • Gabriela Feitosa Rezende 	Michael Hamilton, Assistant Professor, Katz Graduate School of Business	Using a two-part plan that relies on practical improvements and a technologically creative and sustainable idea, the solution proposed providing K-12 students experiencing housing insecurity with academic resources at learning centers. It also proposed affordable, sustainable 3D-printing to construct permanent housing to break the cycle of homelessness.

Team 3

Students	Exec Coach	Solution Summary
<ul style="list-style-type: none"> • John Sopko • Jacob Buls • Yu Cing Kuan • Zehui Wang 	Bharat Dash, Sr. Technical Project Manager, SDLC Partners	Implementing a holistic approach which considers multiple interconnected aspects of the problem, such as cost, eligibility thresholds and recurrence, and long-term support services, this solution aimed to increase the efficiency of the three phases of rapid rehousing to help individuals permanently exit homelessness in a cost effective manner.

The Winning Solution

While all teams presented well-thought out potential action plans, Team 5's solution optimally addressed the pre-established judging criteria and has the potential to provide extensive support to Allegheny County's homeless population in the near term.

The winning team, consisting of MBA student Carloz Gil and Master of Science students Rebecca Farabaugh, Xingyu Li, and Tianyang Xie, identified four problem areas: access to basic-need items such as laundry and refrigeration; access to transportation and proximity to support; communication barriers such as no phones or permanent addresses; and identification barriers.

Team 5's solution focused on delivering services in high-need areas through pop-up centers. The students also proposed tracking access to basic needs so that Allegheny County can support, predict, and improve rates of transition to stable housing. Notable highlights from this Team's solution that weighed in their favor included:

- Team 5 incorporated someone's personal experience around



homelessness, allowing them to optimize their storytelling and proposal justifications.

- Each phase of their deliverable relied on data to make their solution more accurate, as well as practically implementable over a quick timeline.

- Team 5's solution is adaptable and could be altered to fit various financial, timing, and manpower restrictions that Allegheny County, or other counties, may potentially experience.

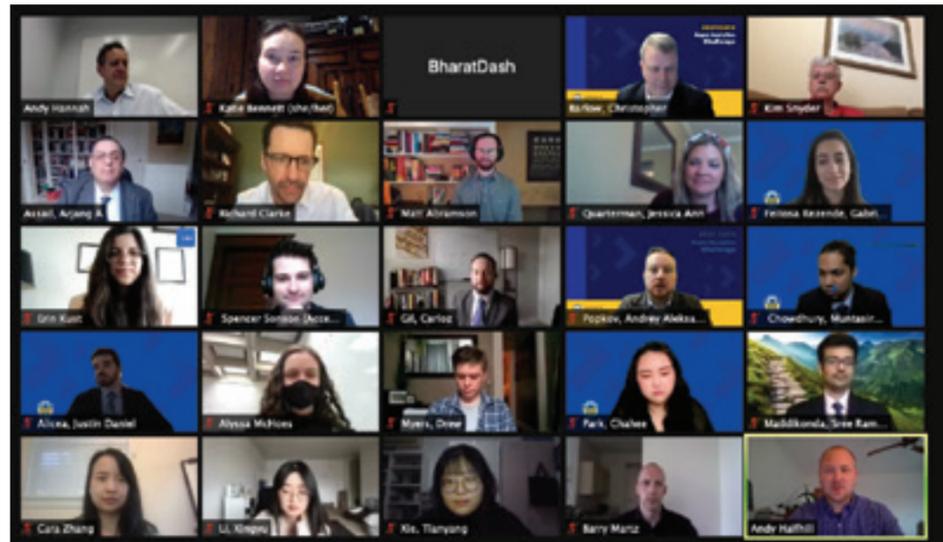
Team 4

Students	Exec Coach	Solution Summary
<ul style="list-style-type: none"> • Erin Kust • Ankita Chouhan • Alyssa McHoes • Pesaru Reddy • Chun (Cara) Zhang 	Sunil Sah, Senior Analytics Architect, SAP	This team developed an Optimize Existing Resources Better (OERB) model. The model creatively utilized relevant data and machine learning, particularly surrounding the notably high intersection of individuals experiencing homelessness and jailing. The OERB model uses a predictive algorithm to anticipate what support resources are most optimal for an individual.

Team 5

Students	Exec Coach	Solution Summary
<ul style="list-style-type: none"> • Rebecca Farabaugh • Carloz Gil • Tianyang Xie • Xingyu Li 	Barry Martz, Sr. Director of Analytics, Health Plan, UPMC	Team 5 suggested that by delivering services in high-need areas, and tracking access to meeting basic needs for the homeless population, DHS can support, predict, and improve rates of transition to stable housing. By utilizing data at each step of their process, and showcasing how the process will become more accurate over time with more data, this team provided practical ideas on how to support people as they regain stable housing.

STUDENT TEAMS + SOLUTION SUMMARIES



Team 5 on TechVibe Radio

Based on scoring through all three judging phases, Team 5 received the highest aggregate score.

Listen to Carloz Gil, featured on the Pittsburgh Technology Council's [TechVibe Radio program](#), as he shares his experience from the Challenge.

Visit the [Katz YouTube Channel](#) to view all of the final presentations.

Bridging Solutions to Implementation

To further drive impact from the Challenge, members of the winning team are eligible for a [Katz Bridge Fellowship Program](#) to implement their solution. As a team, the students will consult with Allegheny County DHS to immediately execute aspects of their project.

They will be guided by Katz faculty, staff, and executive advisors. The fellowship includes a \$2000 stipend per student generously supported by Accenture.

In 2021, Katz is funding, with donor support, additional Bridge Program projects aimed at aiding community-based partners as they address operational complexities. Projects are run in the summer from June-July.

Participant's Perspective

"The most meaningful and impactful part of my experience so far has been connecting to people affected by homelessness in Allegheny County and listening to their experience. My team's project was inspired by one person's story and their personal insight into what makes transitioning to stable housing so difficult.

"They encouraged us to consider homelessness as a person experiencing homelessness would, and to see it through their eyes, in order to identify the most significant barriers and meaningful action.

"Connecting the data to the human experience is crucial when working on an issue as complex as homelessness, and my efforts to understand that experience have been eye opening."

- Rebecca Farabaugh, MS Student, Katz – and Team 5 member

IMPACT SUMMARY

When considering the impact of the Super Analytics Challenge, there are multiple layers that must be acknowledged. Benefits ranged from addressing the issue of homelessness itself, to student skill development, to wider ramifications in the local community and beyond. These multifaceted outcomes are explored throughout the below.

The Topic: Homelessness

As outlined earlier in the report, the topic of homelessness was a rally point for this Challenge. Andy Halfhill, Manager, Homeless/Housing Analytics, from Allegheny County DHS noted that a cardinal benefit for collaborating on the Challenge has been raising awareness around the complexities of homelessness. Plainly put, there is no simple reason for why an adult, family, or child becomes homeless.

This form of partnership around a social cause serves to bolster voices, resources, and perspectives. By spanning academic, government, corporate, and nonprofit organizations, this Challenge has served, in part, as a community symposium on the issue of homelessness.

From the Katz perspective, additional work is underway to drive impact. Bridge Program fellowships, in collaboration with community and corporate partners, will allow students to consult to further develop and implement innovative solutions to complex social problems.

Advisory Committee members noted that the topic directly relates to their organizations' goals to support sustainable outcomes, impact humanity, improve communities, and support the generation of knowledge and thought leadership.

Students responding to the post-Challenge satisfaction survey stated overwhelmingly that they were 'extremely satisfied' with addressing the topic of homelessness. Stated another way, this is what most interested and best motivated them to dedicating extra time away from courses to work on this extracurricular activity.

"It has been three months since I moved from India to the US. I never expected this opportunity would come in line with my area of interest. It was such a great honor to work with a pool of experts from various domains."

- Anonymous Student Survey Respondent

"At SAP, we view and approach problems from different perspectives – with an outside-the-box thinking. We run analytics and innovation challenges internally and with our clients. The Super Analytics Challenge mirrored the skills and insight-driven thinking that our clients require from us."

- Manpreet Saini, Practice Head, Analytics & Insight, North America, SAP

IMPACT SUMMARY

Skill Development: Preparing the Workforce of Tomorrow

The Challenge conceptualized specific learning objectives from the start. Through the post-Challenge survey, we asked students to rate on a 1-10 Likert scale how well they felt the Challenge helped develop their skills, including:

- Business analytics
- Business communications
- Learning a Complex Social Problem
- Leadership
- Networking
- Teamwork
- Applied consulting strategies

In their responses, students indicated 'definite yes' to skill development (9 out of 10) to the above. Teamwork topped the scale, followed by Leadership and Learning a Complex Social Problem. Interestingly, this corresponded to feedback from Advisory Committee members in that the value of this Challenge extended beyond generating data models.

Andy Halfill from DHS noted that he was enthused to see a business school applying strategy and management concepts to examine a social cause, a domain more typical of a public policy school. He stated that it was positive to see the energy that students applied to this topic, as they were able to share a different take by, for example, examining services from a supply and demand perspective. He further noted that while analytics is becoming more commonly applied in the public sector, it is still a burgeoning skill set that has room for further development.

For Advisory Committee members, coaching students on the skill sets needed in the workforce is a positive Challenge outcome. The Committee's input on the Challenge construct – for how students should frame problems, apply data methodologies, and practice storytelling as a communication tactic, represents *active* skill development. This is different from *passive* skill development, in which corporations recruit students with the expectations that students are prepared with the skills for the workplace of tomorrow.

This form of partnership allows organizations to actively ready young professionals to enter today's workforce, a relationship that should be further explored between corporations and graduate schools.

"The students did a fabulous job looking at the issue through different port holes. This Challenge brought a global view versus other analytical competitions that concentrate on drawing needles out of hay-stacks of data."

-Pamela Peele, Chief Analytics Officer, UPMC Health Plan / UPMC Enterprises

"This was not homework. This was very much the real world."

-Matt Abramson, MBA Student, Katz

The Externalities: Additional Benefits from this Challenge

The Challenge was designed to bring multiple parties together, to harness resources, to rally around a complex societal problem. Yet there are also positive external benefits through this community-based partnership – most specifically in sharing knowledge and resources.

For the Advisory Committee, this included mutually supporting each other – be it our community health broadly in the case of Highmark and UPMC, or the National Association of Counties supporting their member counties, including Allegheny County – as examples.

In addition, Challenge partners were able to leverage participation to support talent retention and senior management's professional development. Advisory Committee members connected their team members to support this cause while also augmenting their mentorship, leadership, and presentation skills as organizational subject matter experts.

The relationships built between these SMEs and the University of Pittsburgh students also provide a networking opportunity that could translate into a direct talent pipeline.

Further Measure

Given that the Challenge concluded in March 2021, the downstream impact will require time to evolve. We will continue to address the following questions, revolving around anticipated impacts:

- Did aspects of student teams' solutions take effect in supporting DHS services for the homeless population?
- What is the effect of the solutions on the population of interest itself – those experiencing homelessness in Allegheny County?
- What results were borne directly from the Bridge Program fellowships completed by students working on this topic?
- Were elements of this Challenge shared broadly, or spun off, with other communities, for example in the academy, the public sector, or in the private sector?
- How did the Challenge impact students' career paths, either in their choice of industry or furthering their professional dedication to analytics?

As Katz organizes future Super Analytics Challenges, these downstream impacts will continue to be measured.

"There was significant value for my staff that participated as coaches. Engagement with universities, graduate students, and the communities that we serve is an important part of our employee value proposition. This type of engagement is a great way for my staff to step away from their day-to-day work and leverage their expertise to support not only the learning and development of the students, but the creation of practical solutions to help the county. This was especially meaningful because it both needed their expertise and addressed homelessness, a critical issue, that they were passionate to help positively impact."

-Richard Clarke, Chief Analytics Officer, Highmark Health



LEARN MORE

To learn more about the 2021 Super Analytics Challenge, visit the Katz Super Analytics Challenge landing page. Here you can read media coverage, listen to related podcasts, review the final student solution presentations or download the case.

<https://www.katz.business.pitt.edu/2021-katz-super-analytics-challenge>

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Want to get involved with a future Super Analytics Challenge, connect in with other community-based initiatives, or support Katz graduate student programming? Contact Christopher Barlow (cbarlow@pitt.edu) for more details.