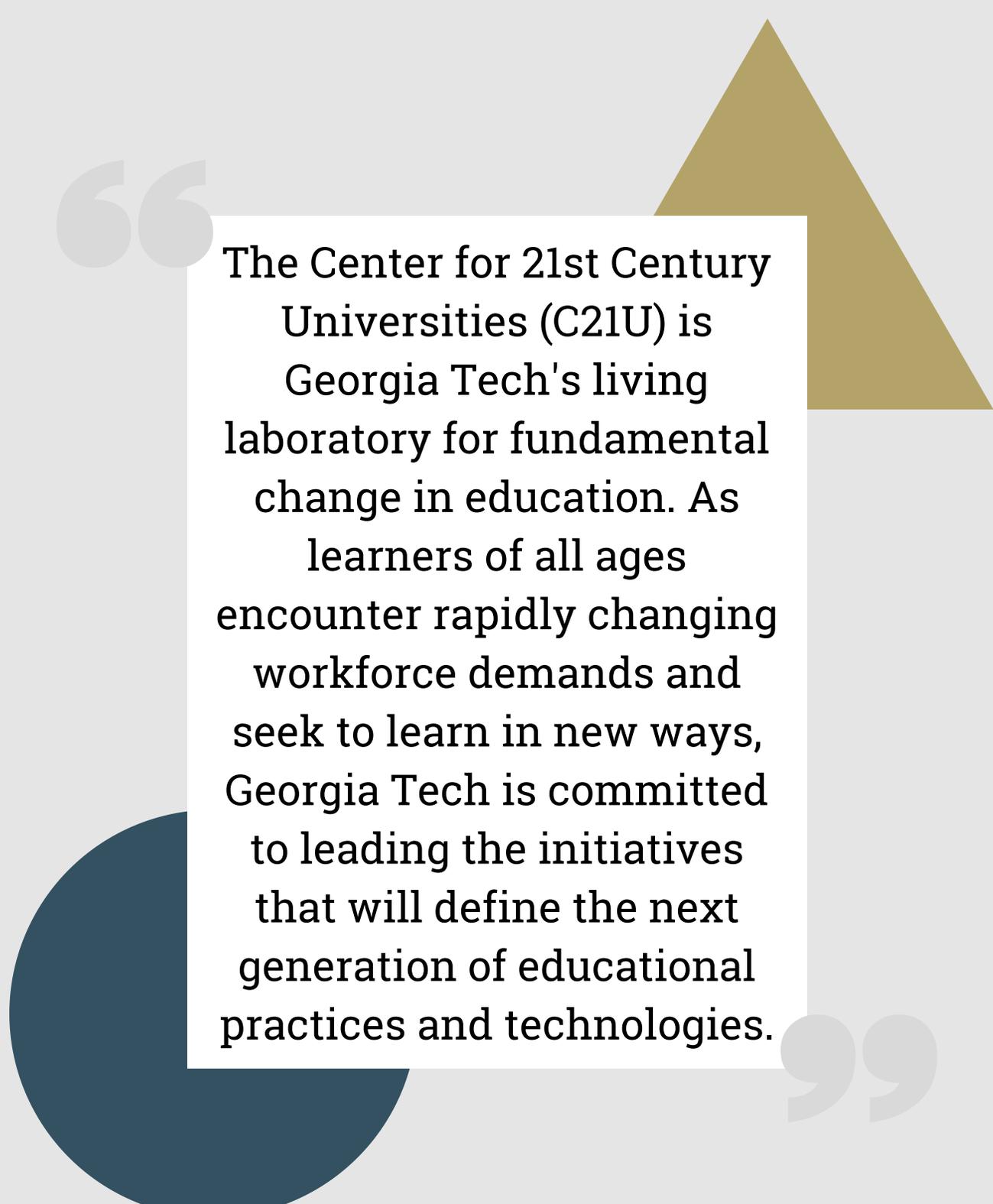
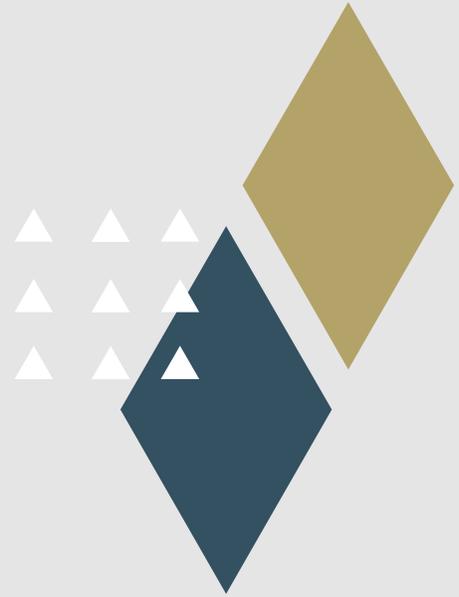


Innovation and Impact Report

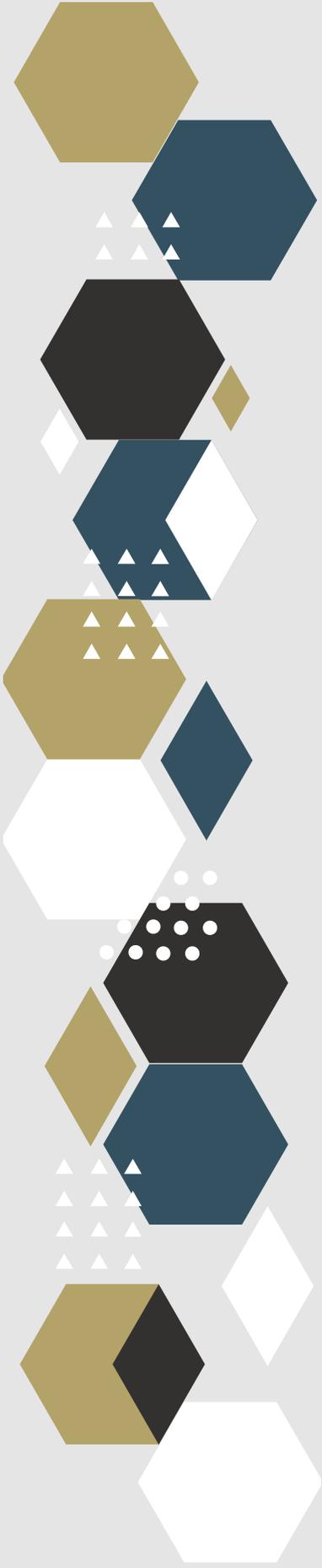


The Center for 21st Century Universities (C21U) is Georgia Tech's living laboratory for fundamental change in education. As learners of all ages encounter rapidly changing workforce demands and seek to learn in new ways, Georgia Tech is committed to leading the initiatives that will define the next generation of educational practices and technologies.



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from the interim executive director

At this point it goes without saying that 2020 was a year unlike any other. As a living laboratory dedicated to fundamental change in education, the Center for 21st Century Universities is perhaps better prepared than most when such change is thrust upon us. Change is a big part of what we do.

For us, the change really began in February of 2020, when our founder, Rich DeMillo, announced that he was stepping down as executive director of C21U. Rich created the center in 2011, and in doing so became a formidable advocate for positive change in higher education. Over the past 10 years, Rich and C21U have been recognized internationally as thought leaders in advancing research, development and implementation of educational technologies, and in designing technology-driven solutions that result in optimal student outcomes through creative institutional change. Rich's vision and leadership brought to life many of the signposts that are guiding us now, such as his leadership with the Commission on Creating the Next in Education (CNE) and its groundbreaking report on the future of higher ed.

We knew we were in for a momentous year when Rich announced that he was stepping down. However, we had no idea of how momentous 2020 would be for reasons outside of what we could have predicted.

When the COVID-19 pandemic struck in March of last year, Georgia Tech (and most universities), pivoted to emergency remote teaching over the span of about two weeks. (Please note that we are careful not to call it online learning, for the emergency measures we took were in no way indicative of the online courses produced in a typical academic year.) C21U was at the forefront of this pivot and has continued to help lead the Institute as we define the most optimal paths going forward. We quickly realized that we were being given an unprecedented, albeit unwelcome, research opportunity. What happens when an entire university suddenly goes remote?

C21U quickly implemented a research protocol using both qualitative and quantitative methods and we are in the process of publishing our initial results now. In conjunction with Georgia Tech Professional Education and the Center for Teaching and Learning, our team also helped lead the ongoing Remote Teaching Academy for all of the Institute's faculty. At the same time, we began creating new tools to help improve student engagement.



At present, we are keenly focused on student engagement and how we can ensure and improve it. Using some of the big data techniques that we have been pioneering in our VIP classes, C21U has been able to identify students early on who are struggling in the new remote environment. We created a Key Performance Indicator (KPI) tool which allows faculty to gather feedback about student learning in a low stakes/high-frequency manner.

While 2020 was a year of inward focus due to the pandemic, we did not forget our broader focus on improving education as a whole. I officially began my role as interim executive director of C21U in July 2020 and have been working to balance our internal efforts to support our learners during the pandemic with our broader, external efforts.

We've maintained momentum in larger-scale initiatives, such as our founding membership in the Digital Credentials Consortium, a group of 12 leading universities focused on creating new ways of awarding credit for, sharing, and verifying students' knowledge, skills, and aptitudes. We were awarded an ongoing NSF grant to apply machine learning and AI to workforce development by matching educational opportunities to needed job skills. We continue to make progress with many of the programs that we envisioned in the CNE report. Of particular note is the GTatrium, a small footprint co-learning space designed to benefit the distributed Georgia Tech community, which received Phase I funding from the Charles Koch Foundation.

2020 has been an immense challenge for all. C21U would not have made it through the year without the tireless work of our dedicated faculty, staff, graduate researchers and community. We have learned about massive and rapid shifts in instructional modes, and these lessons will benefit our broader agenda of bringing about positive change in education. We never considered a global pandemic as a driver of change in education, but we now have a fundamentally altered perception of the future of learning and new knowledge of how to serve the Georgia Tech community – both locally and globally.

Steve Harmon
Interim Executive Director

c21u team



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how challenging is emergency remote instruction during a pandemic?

The C21U research team dedicated much of 2020 to an exploration of the many ways Georgia Tech faculty adapted to remote emergency instruction. Our research continues to focus on how we can best support remote instruction in the midst of the unexpected.

In March of 2020, Georgia Tech rapidly shifted to emergency remote instruction in response to the COVID-19 pandemic. During this time, the research team in C21U worked closely with teams from across campus to support this unprecedented instructional transition.

One of the mandates of C21U is to consider and act on fundamental shifts in the nature of higher education. Perceiving the massive impact and future implications of this shift to remote instruction, our research team spent much of 2020 exploring how Georgia Tech faculty were adapting to remote emergency instruction.

Our team undertook a mixed-method study to gather a snapshot of the experiences of instructors who were confronted with the sudden need to move from face-to-face to a virtual or hybrid format. Interestingly, we

found that faculty participants' attitudes toward remote teaching differed to some extent by course subject and prior experience using technology. Participants also expressed that they were challenged in areas such as time constraints, spotty internet connectivity, engaging students in interactive learning experiences, and assessing students with the same rigor as would occur during in-person courses.

With new tools designed to better support remote, instructional success and additional resources from their own college or department (71% of participants rated this type of support "very helpful" or "somewhat helpful") and directly from peer faculty (73% rated this "very helpful" or "somewhat helpful"), we have seen that our faculty are incredibly agile and willing to try new instructional modalities.



In light of this data, C21U sought to develop a resource that would help faculty address student engagement challenges. Using big data analysis techniques first piloted with VIP students, our research team, led by **Jonna Lee**, developed and piloted a student outlier analysis tool that helps instructors quickly identify students who may be struggling with remote instruction.

a new tool designed to support student engagement

In response to the challenges faced during remote emergency instruction, C21U designed and piloted a new Key Performance Indicator (KPI) tool that provides instructors with snapshots of student performance.

With more Georgia Tech instructors than ever before teaching remote and hybrid courses, insights into course experience are critical for the continued success of both instructors and students. With that in mind, C21U developed a new tool that provides instructors with course-specific weekly

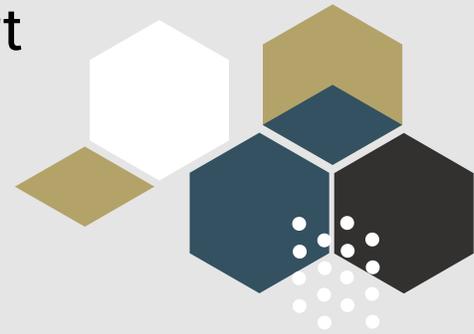


snapshots containing helpful insights into student performance.

Currently being integrated with Canvas by C21U's GT Apps Lab team of developers, led by **Matt Lisle**, and researchers, led by **Jonna Lee**, and the cross-unit Digital Learning Team, the Key Performance Indicator (KPI) Tool gives instructors a new, near real-time measure of student progress.

Tested by a small group of faculty during Summer 2020 semester, the purpose of the tool is to help instructors monitor the student learning experience and gain insight into how to enhance learning in future remote and hybrid courses.

One faculty member who tested this tool in Summer semester courses noted that the KPI Tool allows them to "(be) more cognizant of the students' actual understanding." Another faculty member shared that the tool empowered them to



"gauge student learning as well as their views of how the various aspects of the course experience are going."

As Georgia Tech continues to explore remote instruction in 2021 and encounters novel student needs in an increasingly hybrid educational environment, resources like the KPI Tool are a starting point for the design of tools that support increased student engagement. C21U believes this tool will be useful for faculty and instructors adjusting to a "new normal" of widespread, technology-enhanced instruction, as well as those interested in providing a new feedback mechanism for students.

Due to the success of the initial pilot, the KPI Tool has been made available to any instructor who wishes to opt in via Canvas. If you would like the new KPI tool to be installed in your Canvas courses, just click the GT Apps Labs button in your course navigation.



apps for learning

The C21U Learning Technologies team designs and implements apps and new technologies that support instruction and learning at Georgia Tech. During an unpredictable year, this team of developers has improved, created and supported a suite of 13 apps for Canvas.

While C21U is known on campus as a think tank for education innovation and research, we've also built a highly-skilled team of developers who bring to life and support apps and technologies that improve both the instruction and learning experiences for Georgia Tech.

This team – led by **Matt Lisle**, and including developers **Stuart Freeman**, **Emily Reese**, and **Chris Yang** – has become a critical contributor to the campus technology development community. Since the implementation of Canvas as Georgia Tech's learning management system (LMS), this team has collaborated with C21U researchers and campus partners like the Digital Learning Team to understand constantly shifting campus needs and

to dream up and implement solutions for these needs.

The Learning Technology team works tirelessly to support Canvas apps and the needs of an increasingly remote, global campus.

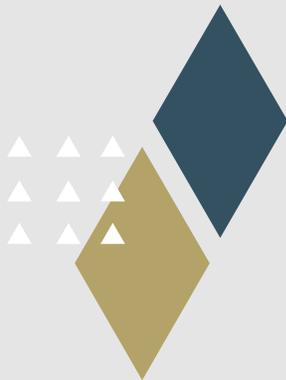
Currently, the Learning Technologies team maintains a suite of 13 Georgia Tech Canvas apps:

- Verifiable Credential Issuer (in development)
- GT Apps Labs
- Canvas Enroller
- GradePub
- KPI
- Course Descriptions
- GT Roster
- PostEm
- Combine Courses
- Roster Editor
- Admin Dashboard
- Add People
- SandboxMe



digital credentials of the future

In 2020, C21U was announced as a founding member of the MIT-led Digital Credentials Consortium, a collaborative, intercollegiate research and design group focused on the creation of verifiable infrastructure for digital credentials of academic achievement.



In February 2020, Georgia Tech joined MIT and 10 other international universities as part of this new, collaborative initiative focused on the digital credentials of the future.

The group released a co-authored white paper, *Building the digital credential infrastructure for the future*, that charts a viable path to developing such infrastructure. C21U's **Matt Lisle** and **Stuart Freeman** were key contributing authors of the report and helped to outline a trusted, distributed, and shared infrastructure that provides viable standards for issuing, storing, displaying, and verifying digital academic credentials.

While the Consortium's research focuses on verified digital academic credentials

in higher education, the group also turns a critical lens to interoperability standards for post-secondary, lifelong learning, and non-formal education providers, which extends to the workplace.

C21U has experimented with blockchain-based academic credentials for some time, piloting digital credentials through various campus education and development opportunities such as workshops and academic seminars. The continued and expanded development of such credentials intertwines with Georgia Tech's Strategic Plan for 2020-2030 and the call to, "Be an innovation leader that defines the future of higher education with new solutions that dramatically improve access, learning effectiveness, and lifelong student success."

competency catalyst initiative

The National Science Foundation (NSF) named Competency Catalyst as one of nine teams selected to receive Phase II Convergence Accelerator funding. Over two years, the workforce reskilling project will receive up to \$5 million in funding from the NSF Convergence Accelerator.

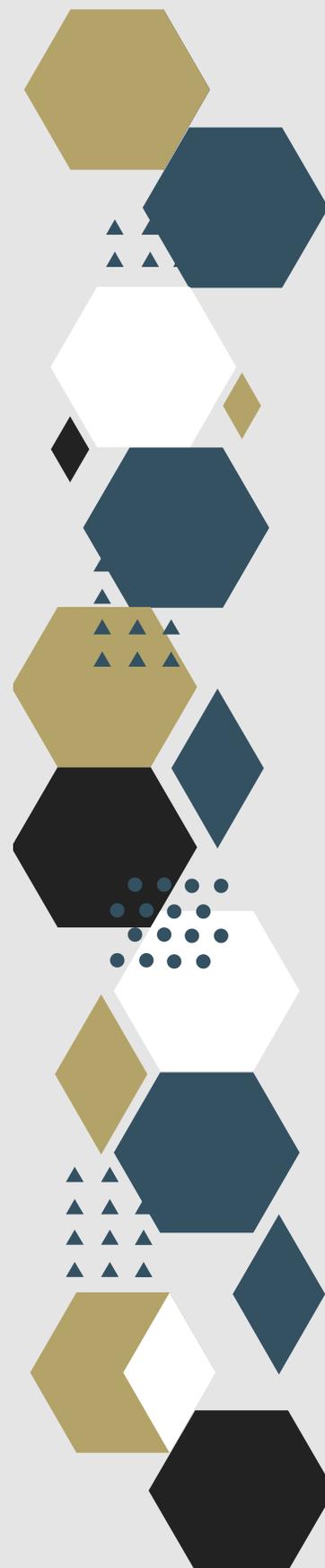
C21U served as the principal investigator for the Phase I development cycle of Competency Catalyst. The Phase II Convergence Accelerator cohort includes just nine of the original 43 teams that received Phase I funding and will provide Competency Catalyst with up to \$5 million in funding for prototype development and pilot projects.

During the two years of Phase II funding, the Competency Catalyst team, which includes Eduworks, C21U, USG, and the Credential Engine, are developing prototypes of digital tools to support critical workforce reskilling in the United States. C21U's **Ashok Goel** and **Matt Lisle** oversee Georgia Tech's Competency Catalyst team.

Over the next two years, Competency Catalyst will create two digital resources to support reskilling – a Skillsync application and a

C2 platform. The Skillsync application enables companies to succinctly express reskilling needs for their workforce. This information is then distilled to colleges and universities so that they can design accelerated educational programs with the needed skills as specific learning outcomes.

The Skillsync application is built on the C2 platform, which is designed to better describe and align job requirements and opportunities for reskilling in specific knowledge, skill, and ability (KSA) terminology. Georgia Tech's Jill Watson AI-based educational assistant, the Credential Engine's open data infrastructure, and Eduworks' digital competency extraction tools and open-source Competency and Skills System (CaSS) provide the framework for these two new tools.





mapping georgia tech's new strategic plan to the cne report



Since the launch of the Commission on Creating the Next in Education's groundbreaking 2018 report, *Deliberate Innovation, Lifetime Education*, much has changed at Georgia Tech. We have a new university president and a new provost. We've experienced a completely novel academic year in light of the COVID-19 pandemic.

C21U has a new interim executive director. Georgia Tech has a new strategic plan for the years 2020 to 2030. However, many of the themes highlighted in the 2018 report -- themes like Lifetime Education, Distributed Worldwide Presence, AI, Whole Person Development, and more -- continue to be both critical to the future of

Georgia Tech and relevant within the new Strategic Plan.

That is why in 2020, C21U undertook a mapping exercise to explore the many ways that the concepts and projects highlighted in the CNE report overlay with Georgia Tech's new strategic vision for the future.

You can explore the detailed map at c21u.gatech.edu.

gtatrium

GTatrium is the reinvention of a university's physical presence in a form that is a more personal, affordable, and effective way to experience learning opportunities. This distributed, global co-learning concept will be realized as a scalable gathering place and portal to real and virtual services.



With the Spring 2020 onset of a global pandemic, we saw a sharp increase in use of remote and digital education in higher ed. As a result, the GTatrium team was forced to pause and consider its role as a critical bridge and co-learning hub for thousands of Georgia Tech students across the U.S. and the world who would be unexpectedly studying from home for the foreseeable future.

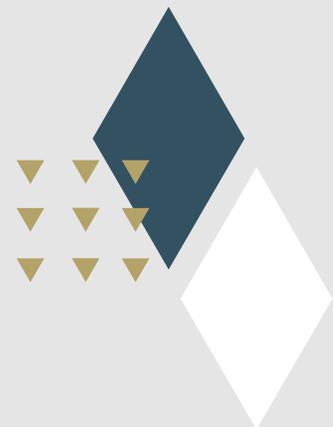
In light of the shifting landscape of global education, the GTatrium team spent 2020 refocusing on crucial research and product development centered around remote community and student-experience needs. This effort included the start of an ongoing case study with a global group of Georgia Tech students, researching and conducting a small pilot of the Living Library for Learning (L3) programming in collaboration with globally-based Georgia Tech alumni, exploring new learning and safety needs for the GTatrium incubator facility in Atlanta, and more.

During 2020, GTatrium began and completed the process of becoming a business

subsidiary of Georgia Advanced Technology Ventures (GATV). **Rich DeMillo** was named Managing Director and the GATV Innovation Group was established as a Board of Directors for GTatrium.

Through a generous gift from the Charles Koch Foundation, Phase I of the GTatrium initiative has now been funded.

GTatrium, LLC. will be headquartered in Georgia. The GTatrium team is currently working to finalize plans for the construction of the first permanent GTatrium hub, as well as additional, international hubs. **Rusty Greiff** has been hired as a Senior Advisor for GTatrium, LLC. and will begin work with the GTatrium team to prepare for the launch of a first wave of deliverables throughout 2021.



2021 and the future of education at georgia tech

In the midst of 2020, an incredibly challenging year due to the institutional and individual impact of the COVID-19 pandemic, the C21U team accomplished much. Now, with eyes to new challenges and new opportunities, we have an exciting vision for the future.

2020 often felt like a marathon year of uncertainty. Across the globe, K-12 schools, universities, workforce reskilling programs, and basically every educational institution and organization felt the impact of the pandemic. However, we in C21U have hope for a new, and better future for education in 2021.

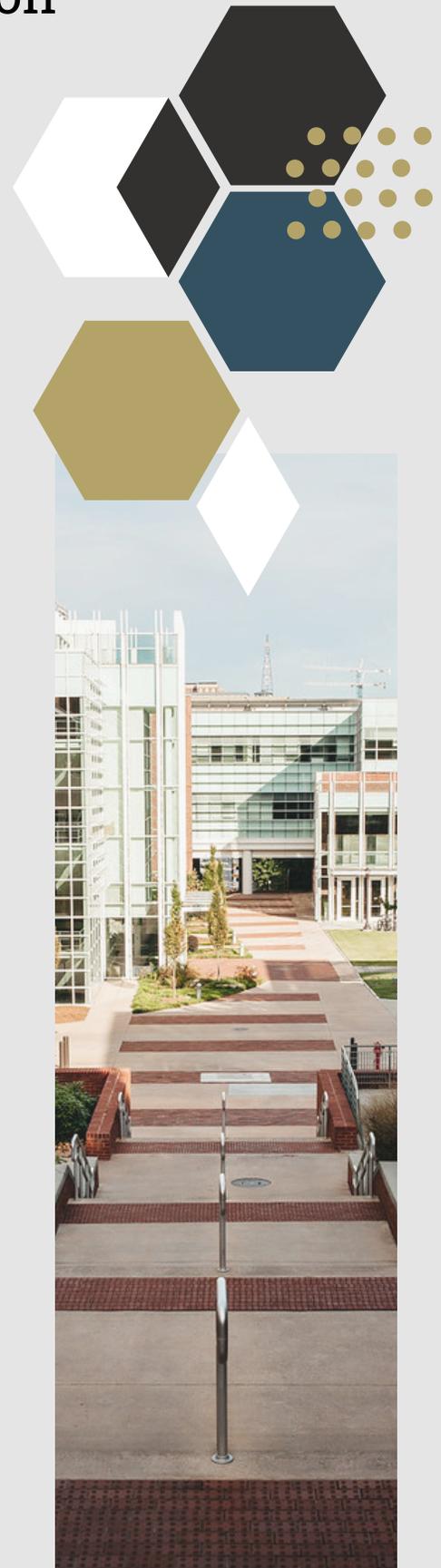
The past year was an education for us all. We have seen just how agile Georgia Tech faculty and instructors can be – many of them testing and adopting new teaching tools that were previously unfamiliar so that they might provide the best learning experience for students from afar.

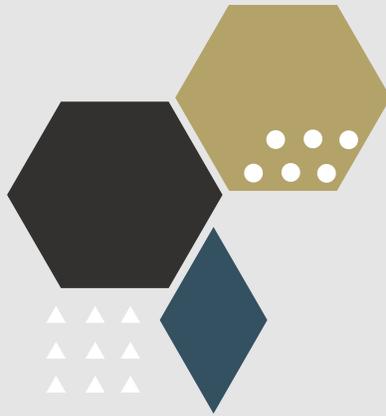
We have seen that students from around the United States and the world continue to desire a Georgia Tech education and our online program registration is higher than ever for 2021. We have seen teams across

campus, C21U included, learn to work remotely when needed, leveraging previously underused digital tools for collaboration.

2021 is the time to apply these lessons and rethink the possibilities of education at Georgia Tech. This includes increased support tools and mechanisms for the instructors who continue to teach remote courses, new research and products focused on building community for students not able to come to the Atlanta campus, the use of technology like AI to foster these remote communities, new digital products to support reskilling for a struggling national workforce, and so much more.

As we navigate the fundamentally changed educational landscape of 2021, C21U is committed to supporting Georgia Tech in leading and defining this new future.





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