

# kepler.

Project Description  
Summer 2013

## EXECUTIVE SUMMARY

Over the next decade, Africa's working age population will grow by 75 million—dramatically higher than any other region in the world. If those millions of young people become skilled members of their local economies, the demographic dividend could lift millions more out of poverty and transform the economic and social future of the continent. However, if the status quo remains, a generation of unskilled and unemployed labor will suffer through decades of economic depression and social instability. African higher education urgently needs to adapt to confront this spike in population.

Kepler is a disruptive new approach to solving the crisis of higher education in the developing world. Launching in 2013, our pilot campus in Kigali, Rwanda will be the first university to bring together three major innovations in education and technology for the first time: (1) online courses from leading international universities, e.g. Harvard, UPenn; (2) intensive, in-person instruction using proven techniques from high-performing schools, e.g. no-excuses charter schools; (3) employment-focused learning through structured internships and employer participation. Just as mobile phone technology obviated the need for investment in landlines in the developing world, Kepler's innovative use of technology points a new way forward for governments, universities, and startups to provide quality higher education without the need to invest in the expansive campuses, lavish capital campaigns, and tenured faculty that make the traditional university model an impossible fit for countries like Rwanda. And unlike existing universities, **Kepler is structured around a single outcome: educating students in the developing world for competitive careers in knowledge work.** Our pilot campus will test how to deliver this outcome by blending online academic content from leading universities with tailored in-person teaching and coaching from a team of on-the-ground Teaching Fellows, resulting in a B.A. from an American university. Our goal is to create a high-quality university with sub-\$1,500 tuition rate that can be scaled by us and others—with the goal of enrolling 15,000 students at campuses across Africa by 2020 and impacting millions more indirectly through the widespread adoption of Kepler's educational innovations across public and private institutions.

The project is being incubated within Generation Rwanda, which has been working on this challenge for nearly a decade. Originally founded to provide access to higher education for Rwanda's most driven and talented students from marginalized backgrounds, GR now operates one of the most visible and highest-performing scholarship programs in East Africa. With 98% graduation and 98% long-term employment rates that rival elite universities and scholarship services around the world, GR has inspired a generation of Rwandan students to strive for the careers they deserve, despite growing up under debilitating poverty and conflict. GR receives thousands of applications annually, and while the organization has produced strong results, the overwhelming need cannot be met by scholarships alone. In its place, a scalable, comprehensive, and sustainable solution is needed—one that is up to the challenge of training the next generation of human capital in diverse regions across the developing world.

## A GROWING CRISIS IN AFRICAN HIGHER EDUCATION

The price nations pay for low education of their population and lack of inclusive markets is high. They fail to mobilize their nascent talent. They have many potential Bill Gateses and perhaps one or two Albert Einsteins who are now working as poor, uneducated farmers because they never had the opportunity to realize their vocation in life.

Daron Acemoğlu & James Robinson  
Why Nations Fail

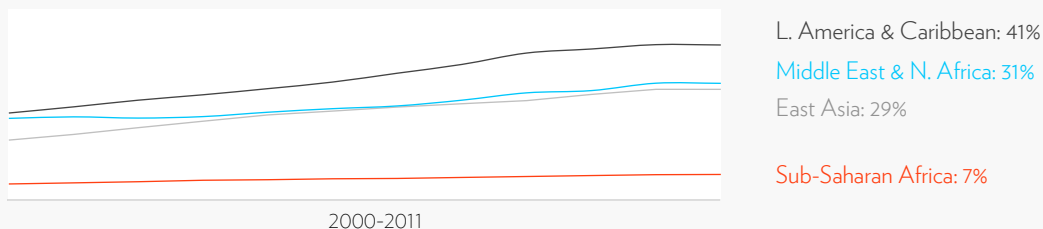
As Rwanda, Kenya, and other progressive African nations begin to achieve growth through modern service-based economies, they are being confronted by a lack of human capital to fill positions that require skilled knowledge workers. Local universities, inaccessible to all but the elite, lack the capacity to train a sufficient quantity of engineers, programmers, statisticians, accountants, teachers, civil servants, and other skill positions that represent the backbone of modern economies.

At the same time, Africa's youth population is spiking—200 million and increasing more rapidly than anywhere else in the world—making the education-to-employment crisis one of the defining issues facing the continent today. Without a dramatic improvement in both quality and accessibility in Africa's higher education system, any larger poverty reduction goals will remain illusory, while millions of young secondary school graduates are greeted by unemployment, social unrest, and a lifetime of diminished expectations.

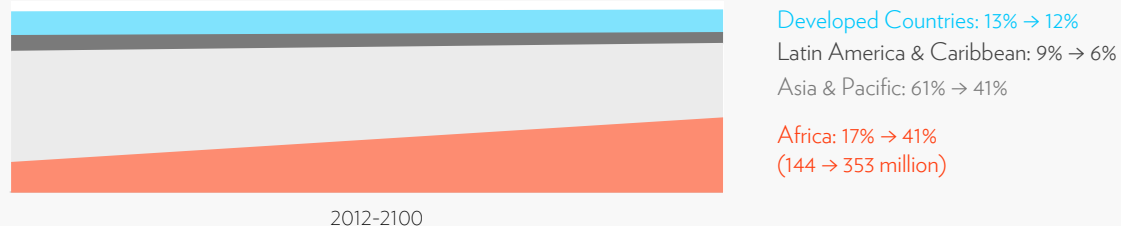
Even in Africa's largest economy, traditional universities have not kept pace with rising demand for higher education: just last year, students rioted in Johannesburg for a limited number of university slots. Ironically, graduation rates in South Africa remain stuck at just 15%. This paradox of intense competition for low quality institutions demonstrates how the problems of access and quality must be solved simultaneously, yet existing institutions have generally not refocused their missions to prepare young professionals for work in modern economies that face intense global competition. Instead, most universities in the developing world still rely on

### AFRICAN HIGHER EDUCATION IN CONTEXT

% OF POPULATION WITH UNIVERSITY DEGREE



% OF GLOBAL COLLEGE-AGED POPULATION



pedagogical models that would be familiar to students from the 1950s: crowded lecture halls, rote learning, and no professional training.

Regressive educational practices have led to a crisis in employment for Africa's human capital: a recent Brookings Institute study reports that around two-thirds of all youth in the African labor market, 95 million individuals, lack the necessary skills to be competitive in the labor force. Again, the present situation in South Africa provides a stark parallel: youth unemployment and unfilled knowledge sector positions both remain stuck at 600,000. The recommendation from Brookings is for greater emphasis on secondary and higher education rather remaining rigidly focused on universal primary education. A report produced by the African Development Bank in 2012 also concluded that the single factor most adversely affecting youth unemployment is skill mismatch. They noted that this is especially true for emerging economies, such as Kenya and Rwanda, where impressive growth is not being mirrored by a commensurate drop in unemployment: youth unemployment and underemployment remains above 40% in both countries. The result of this rift in education-to-employment for individuals was described by *The Economist* as "scarring," the large wage penalty from early unemployment that irreversibly affects an individual's earning potential and well-being over their lifetime.

The emergence of knowledge work as the key driver of growth in the global economy makes higher education more critical than ever for increasing national productivity and competitiveness. A 2002 World Bank report presents the choice facing countries across Africa: "Sustainable transformation and growth throughout [Africa] are not possible without the capacity-building contribution of an innovative tertiary education system. This is especially true in low-income countries with weak institutional capacity and limited human capital." Yet an innovative solution has yet to emerge, leaving millions of graduates unemployed, while high skill knowledge sector positions remain vacant because employers cannot find qualified candidates.

Like East Asia in the mid-20th century, these demographic trends could lead to a level of economic and social development that transforms the prospects of the entire region, spreading growth and displacing dictatorships. Apart from clear economic benefits, higher education results in a host of positive development outcomes: increased political stability, even when controlling for income; stronger human rights and civic institutions; greater democratization and institutional engagement; less income inequality and barriers to economic activity; lower crime and lower criminal justice costs; and lower population growth and other negative environmental factors. These benefits set the table for future growth as part of a dynamic, virtuous cycle. Countries like Rwanda and Kenya aspire to become models for growth based on the quality of their human capital rather than natural resource wealth. Yet if they hope to reach their development goals through hard-won growth in the knowledge sector, they must first reach a solution to the impending crisis in education-to-employment.

## TECHNOLOGY & DISRUPTION

There is one big thing that leaves me incredibly hopeful about the future, and that is the budding revolution in global online higher education. Nothing has more potential to lift more people out of poverty — by providing them an affordable education to get a job or improve in the job they have. Nothing has more potential to unlock a billion more brains to solve the world's biggest problems. And nothing has more potential to enable us to reimagine higher education than the massive open online course.

Thomas Friedman  
New York Times, January 26 2013

Inexpensive and ubiquitous access to the internet presents a partial solution to Africa's higher education crisis that was not possible even two years ago. Fixed broadband prices have halved, as the East African Submarine Cable System and other undersea networks have begun providing Africa with its first inexpensive, high-speed

link to the digital world. Even Rwanda, one of the world's poorest countries, recently completed a \$95 million, 1,500-mile fiber-optic network that spans from Kigali to its most rural provinces.

These advances in internet access come at a perfect time: academic content from leading universities around the world is becoming freely available to anyone with a laptop and the bandwidth, disrupting the geographic barriers to quality higher education for the first time. 2012 was a tipping point for this proliferation of massive open online courses, known as MOOCs. In the past year, over 75 of the world's best universities, from Stanford to Wesleyan, have made courses on nearly all academic topics available online for free, taught by the foremost experts in their field. Coursera, for instance, hosts content from 62 universities across the U.S. and Europe, and presently has over two million active users across 196 countries enrolled in its courses. Yet despite breathless claims by journalists and technologists about the potential for students in South Sudan to take physics courses from Stanford, the promise of MOOCs to revolutionize higher education in Africa is entirely unfulfilled. Of the two million individuals who have enrolled in courses on Coursera, that represents only 1,000 or fewer individuals in sub-Saharan Africa that have finished a class. The current college-aged population of Africa is 144 million.

Higher education will be one the next sectors disrupted by communications technology, and in the next several years, organizations leveraging MOOCs and other online academic platforms will have an outsized opportunity to shape what the future of education will look like. Will the majority of universities be online certificate mills where student learning is discounted in favor of profit, or will they be focused, adaptive institutions that use technology to train globally-competitive students at a reasonable price? Kepler is an attempt to bend the future of higher education toward quality by building a degree program that blends MOOCs and other online resources with the drivers of success that can only be delivered in person. Without a model like Kepler, these innovations in education technology could potentially never reach the developing world, or do so in the form of harmful institutions that provide inferior educational outcomes at extractive tuition rates.

## A DEGREE DESIGNED FOR THE DEVELOPING WORLD

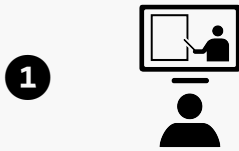
Kepler is designed with a singular focus on exceptional academic and career outcomes at a transformational price. From staffing to curriculum development, every design decision for Kepler is made with student success in mind. Our dedication to measurable outcomes and affordability differentiates Kepler from the vast majority of existing universities, which began with preconceptions about what a university ought to be, what its classes should teach, and what a classroom experience should be. From there, administrators reasoned backwards to develop outcomes and a price appropriate to that model. Kepler was developed instead to move students as efficiently as possible through higher education.

Kepler's model was developed to answer three consecutive questions: (1) What outcomes do we want for our students? (2) What do they need to learn to achieve those outcomes, i.e. the curriculum? (3) How are they going to learn, i.e. the instructional design? The follow sections give a detailed descriptions of each.

## STUDENT OUTCOMES

Our vision for a Kepler graduate is for them to be immediately employable upon graduation, able to advance quickly to leadership positions, and a thoughtful contributor to their society. While we were mindful of the rich literature on the purpose of higher education historically, Kepler's target outcomes were developed primarily by researching what prospective university students, current students, and alumni report they need from higher education, while also asking employers, HR professionals, and managers what they desired in future employees.

## KEPLER OVERVIEW



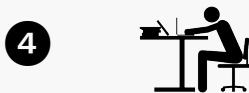
Students stream lectures and complete online assignments, problem sets, and exams developed by professors at leading universities around the world.



Kepler's Teaching Fellows lead seminars to discuss difficult material, build critical thinking skills, and contextualize the topics for Rwandan undergraduates. This is a time when students can analyze, debate, and question their own preconceptions.



Students live and work together in wired group housing, fostering an atmosphere of friendship, collaboration, and academic competition: all key drivers in achieving long term intellectual outcomes.



Kepler connects its students with employers for internships and careers. We're training our students to stand out professionally from day one by partnering with local and international organizations to determine the skills they need for new hires.

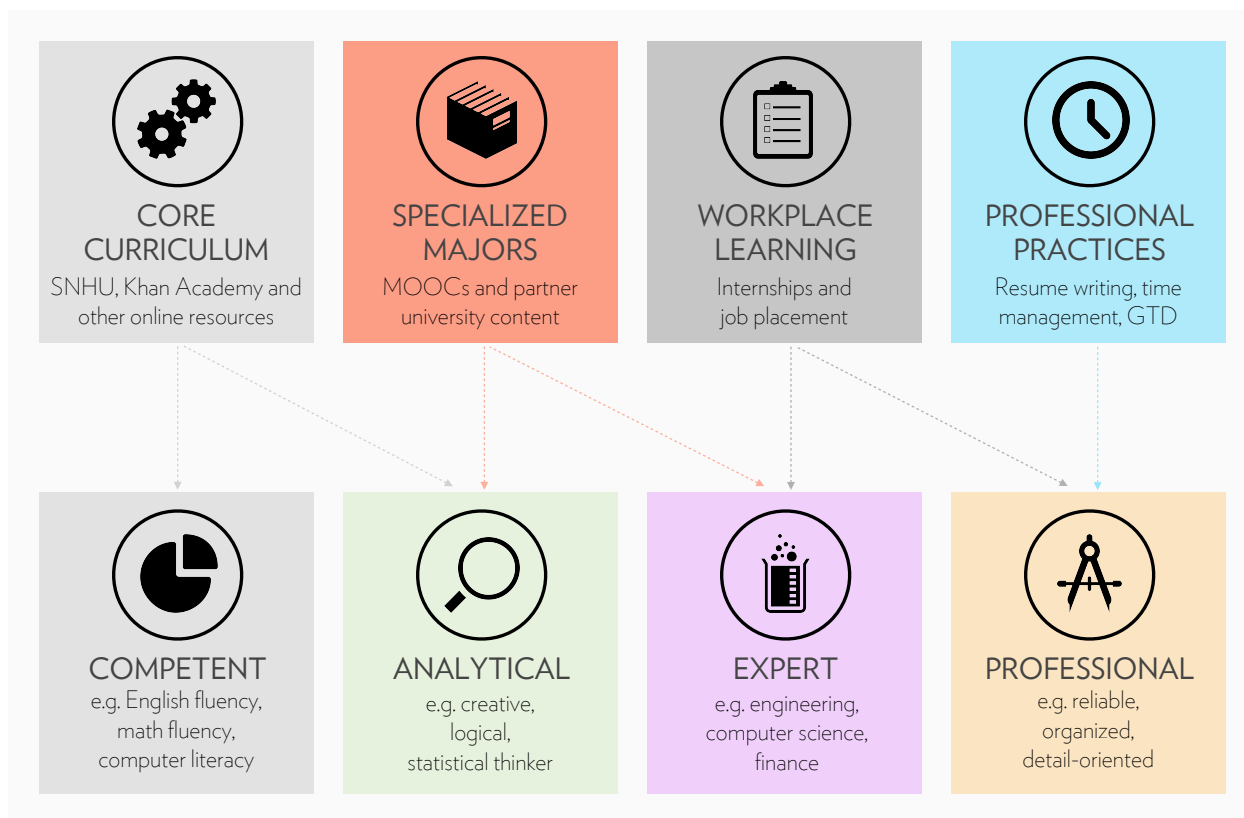
The results of this analysis led us to create a four-category profile of the cognitive and noncognitive abilities a graduate must possess to meet our vision for a graduate: a **competent, analytical, expert professional**.

**Competent:** University graduates in the developing world often lack the basic competencies necessary to engage in any knowledge economy work, regardless of field: literacy, numeracy, statistics, and a baseline understanding of economics, political systems, and world affairs. This is due to factors ranging from poor language instruction to an emphasis on technical specialization during secondary school. By moving to field-specific training before developing baseline knowledge, universities in the developing world graduate engineers who cannot perform basic algebra and international sales managers who cannot locate China on a map.

**Analytical:** A frequent complaint from employers in the developing world is the lack of analytical capacity in the labor pool. After a lifetime of education by rote memorization, employees often cannot solve problems independently, spot issues, think critically, develop creative solutions, or reason statistically. These skills are necessary for any knowledge economy job, and are especially important for mid to late career roles that require operating and managing staff under ambiguity.

**Expert:** Most universities in the developing world require students to spend the entirety of their university years focused on field-specific training. Though we believe that expertise is often best gained early in one's career rather than during a university education, it is nonetheless a vital component of a Kepler education, because employers cite large gaps in subject expertise as an important factor in hiring.

## KEPLER CURRICULUM COMPONENTS AND RELATED OUTCOMES



**Professional:** University alumni and employers report that a lack of training in professional norms hobbles early employment, and many multi-national employers report that these deficits extend to management level positions as well. Punctuality, professional ethics, clear communication, and more broadly, the ability to deconstruct large projects into component parts and milestones are all necessary aspects of employability in roles that increase in complexity and challenge. For the vast majority of employees in the developing world, these professional skills are not introduced until they enter the workforce, if ever.

We believe that students who effectively demonstrate all four of these qualities over four years of testing and task protocols will be well-prepared for globally competitive jobs in any economy, and thus extraordinarily competitive in the context of the developing world employment market.

## THE KEPLER CURRICULUM

To achieve the outcomes above, the curriculum is divided into four components: (1) Core Curriculum, (2) Specialized Majors, (3) Workplace Learning, and (4) Professional Curriculum.

**Core Curriculum:** The majority of a Kepler student's first two years will be spent in an intensive core curriculum, focused on developing their general competencies and analytical ability. The Core Curriculum courses for year 1 are as follows:

# KEPLER YEAR ONE CURRICULUM

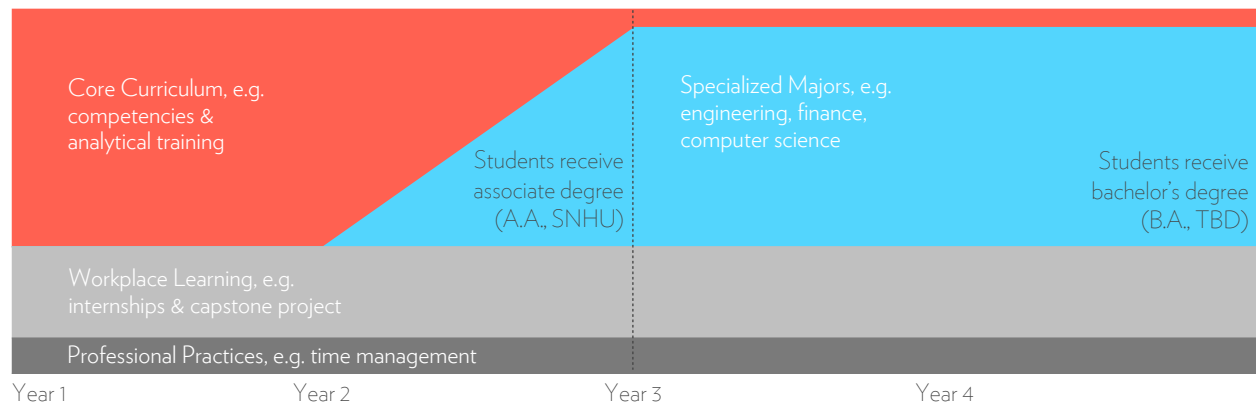
Orientation	Semester 1	Semester 2
Intensive English Communication: Module 1	Intensive English Communication: Module 2	Intensive English Communication: Module 3
Academic & Professional Skills: Module 1	Academic & Professional Skills: Module 2	Academic & Professional Skills: Module 3
Technology Skills: Module 1	Technology Skills: Module 2	Business: Financial Management Entrepreneurship (Babson)
<div> <div>Kepler-developed from multiple content sources</div> <div>Content primarily through online courseware platforms</div> </div>	English Composition: Unit 1 (Duke University and Georgia Tech University, with remedial content from Mt San Jacinto College)	English Composition: Unit 2 (Duke University and Georgia Tech University, with remedial content from Mt San Jacinto College)
	College Algebra (San Jose State University, with remedial content from MyFoundations Lab)	Elementary Statistics (San Jose State University)
	Principles of Microeconomics (University of Pennsylvania)	Introduction to Psychology (University of Toronto)
	Justice (Harvard)	

After completing the Core Curriculum, students are required to prove 120 competencies (listed in Appendix 4) through tasks and testing. Kepler is using content from Southern New Hampshire University (SNHU), Khan Academy, edX, and Coursera for the delivery of the Core Curriculum. All four organizations share Kepler's vision and focus on quality through disruptive higher education. In particular, Southern New Hampshire University—recently named by Fast Company as the world's most innovative education institution—is an ideal degree-granting institution, given their leadership team's focus on student outcomes rather than traditional university objectives. If students successfully demonstrate competencies in the 120 areas of SNHU's College for America program, students will receive a Southern New Hampshire University A.A. degree.

The purpose of the Core Curriculum is not only to build competency, but also analytical thinking. For most Kepler students, the Core Curriculum will be the first time that they will be challenged in an academic setting. Many of them have never been asked to adopt a position and defend it, question received wisdom, or to think beyond the facts to their social, political, and intellectual context. Students will exit the Core Curriculum with a strong command of basic competencies and also with the analytical ability to engage with more difficult courses that are far more complex than anything presently offered at local universities.

**Specialized Majors:** After completing the Core Curriculum, students will specialize in one academic major. The initial offering is currently projected to be Business Management & Finance, Computer Science, and Engineering. The first cohort of Kepler students will not specialize until Fall 2015, so major composition and curricular design are in early stage development. It is possible that Kepler will offer several more majors, depending on student interest, current and future employer demand, and our capacity to provide sufficient instructional and curricular quality. Philosophically, however, we prefer a small number of majors with high

## CURRICULUM OVERVIEW, BY YEAR



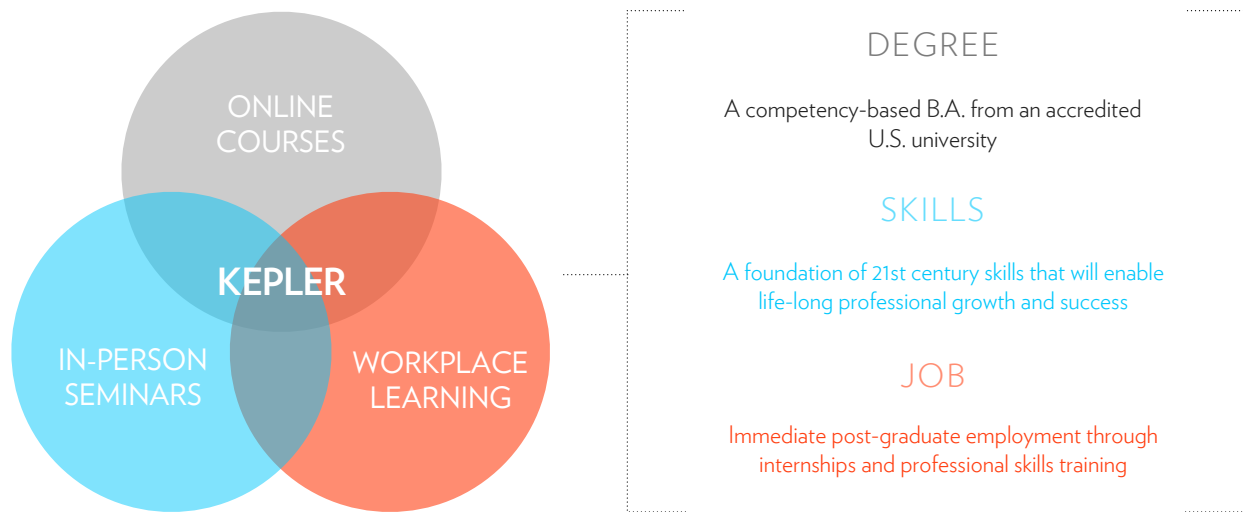
market demand that we can deliver at an exceptional level, rather than risk diluting quality by broadening our academic coverage. We are presently negotiating with several universities to determine who will deliver the bachelor's degree portion of Kepler's curriculum; the most likely candidates are Tulane University and University of Wisconsin.

**Workplace Learning:** Kepler has the advantage of importing an internship program from Generation Rwanda that has been developed over a decade and already boasts a 98% student employment rate—20-30% higher than similar scholarship programs in sub-Saharan Africa. Generation Rwanda's mandatory internship policy in industry-relevant positions is primarily responsible for this remarkable outcome. Of the various global education-to-employment studies that have been conducted recently, there is near-unanimous agreement that students who enter the job market with work experience and employer contacts fare far better than those who focused entirely on academics. Surprisingly, most universities around the world see that as beyond the scope of their mission and do not offer even basic career services. Kepler will not only require students to complete internships and a capstone project with employers, but like Germany's most successful vocational schools (*Hochschulen*), will cultivate relationships with top employers from day one to facilitate student placement.

**Professional Practices:** Over four years and countless hours of interaction with teachers, administrative staff, and peers, there is an enormous opportunity to acculturate students to professional norms and build the professional skills necessary for knowledge economy jobs. Most universities completely miss this opportunity. At Kepler, students will receive a Professional Practices curriculum beginning in Year One, which will continue until graduation—supplemented by Workplace Learning—as both a small standalone curriculum and woven into all other curricular tracks. We are presently working with employers and model professional skills programs around the world to develop this component, which will primarily focus on project and task management, professional communications, and career development skills like resume writing and networking.



## KEPLER DESIGN OVERVIEW



## INSTRUCTIONAL MODEL

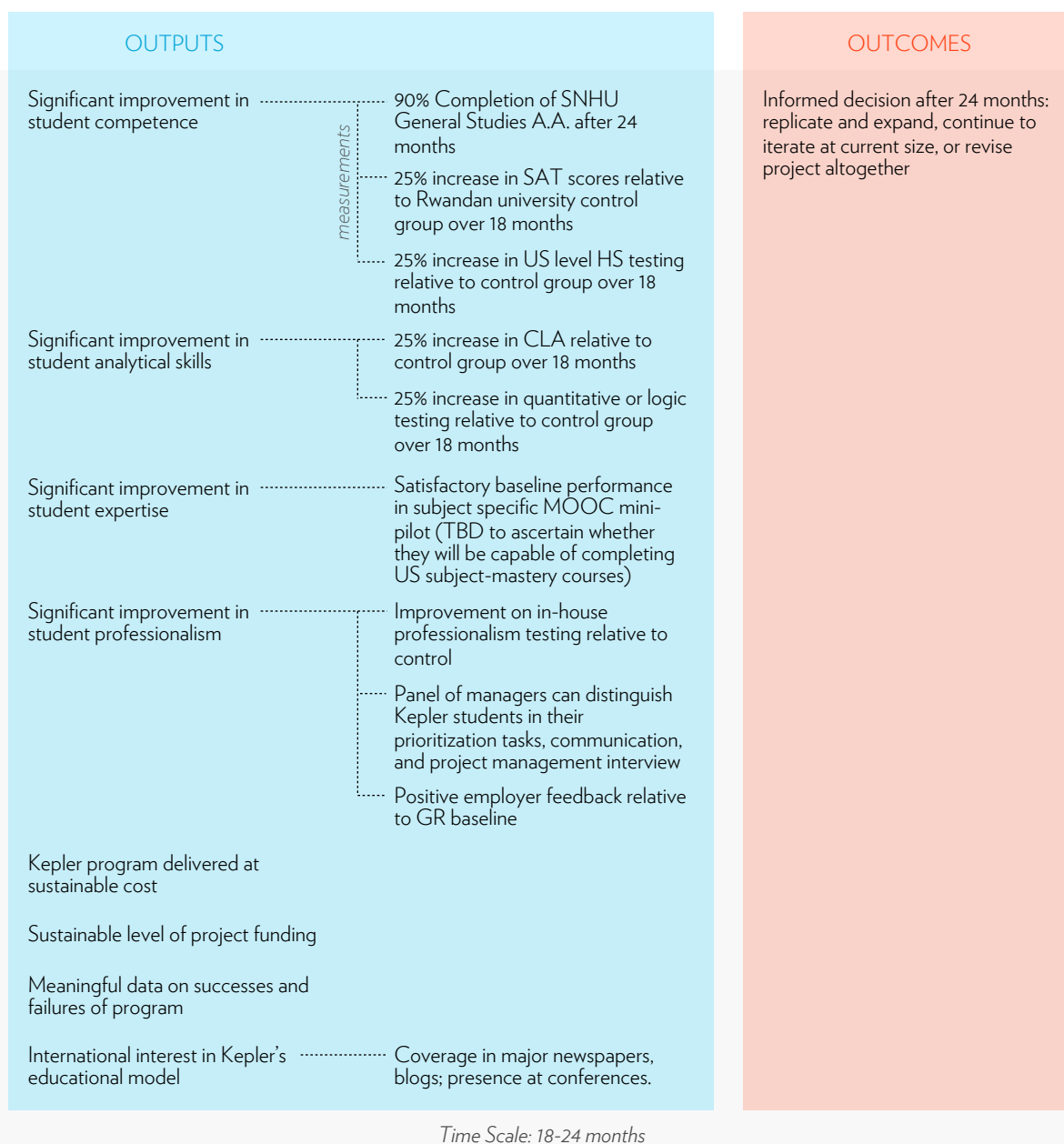
Kepler's ambitious institutional and curricular goals will be matched by exceptional instructional design. Our instructional model leverages two recent innovations in education: blended learning and competency-based education. Both innovations have been tested and refined in developed world classrooms, and have proven to eliminate many of the inefficiencies associated with traditional education.

Blended learning—the combination of face-to-face instruction with online learning activities—has been extremely successful in K-12 and university classrooms in the United States. A 2010 meta-analysis from the Department of Education, based on 45 previous studies, demonstrated that blended learning produces student gains significantly above either online or in-person models alone. In a traditional university class, professors have two primary responsibilities: knowledge transfer and facilitating learning. Few professors naturally excel at this, and even fewer are trained professionally as educators. In fact, at most universities, faculty are incentivized to prioritize research over teaching by the tenure system.

Instead of relying on the in-person presence of professors, Kepler divides their responsibilities between two sources: the knowledge transfer component is delivered online via academic content platforms like Coursera and edX, while the learning facilitation is managed by a team of in-person Teaching Fellows. Their role will be to focus classroom time on assessing student comprehension, structuring group discussion around class-level needs, and directing individual follow-up assignments around student-specific needs. Kepler's Teaching Fellows will be assisted by adaptive learning platforms, such as Schoology and Knewton, to track daily student progress and learning patterns. Though we will hire Teaching Fellows with a record of classroom success in the short term, Kepler's academic staff is already developing a teacher training system that will enable us to successfully employ recent graduates from western universities, and eventually Kepler alumni and local teaching staff.

The second innovation, competency-based education, is a relatively new degree-granting model that has been promoted heavily by the U.S. Department of Education. Rather than focus on credit hours and in-class time, competency-based education requires students to prove practical competencies through assessments and tasks. If a student successfully passes the necessary tests, papers, and assignments, they will be granted a degree regardless of how they learned the material or how long it took them to do so. This is an attractive

## KEPLER PILOT LOGIC MODEL



model for the developing world, since it focuses on equivalence of outcomes, rather than equivalence of process. Under this model, students in every country need to reach the same empirical standard of performance to receive a U.S. accredited competency-based degree, but their pathways could potentially differ significantly from country to country. The standard for receiving a University of Wisconsin competency-based degree, for instance, would not be whether students had spent 120 credit hours learning from University of Wisconsin professors (an expensive proposition), but whether they were able to meet University of Wisconsin's testing standards of general competencies and subject mastery.

By disaggregating assessment methods from teaching methods, Kepler can flexibly experiment with the ideal blended learning instructional model, safe in the knowledge that as long as students pass their associate degree and bachelors assessments, they will qualify for an accredited degree from an American university. Depending on the results of our pilot, it also opens the door to shortening the length of time to a B.A. to less than four

years. Traditional education holds time constant—a student must complete 120 credit hours—but student learning levels are highly variable. Competency-based education holds learning constant—all students need to reach the same learning levels to qualify for a degree—but allows students to reach them at their own pace. Though our degree is initially targeted to four years, two for the A.A., and a subsequent two for the B.A., if the pilot suggests that students can demonstrate the necessary competencies and mastery in a shorter amount of time, we are open to a more flexible timing format, including making the first three semesters of the core curriculum constant, but then allowing students to move at their own pace in self-directed learning afterwards.

In building our instructional model, we are taking a “strong ideas, loosely held” approach, and are committed to experimentation and course correction. In a period of extreme disruption in higher education, our methods are living, refutable, and refined experiments in how to move students towards broad competencies and subject mastery as efficiently as possible.

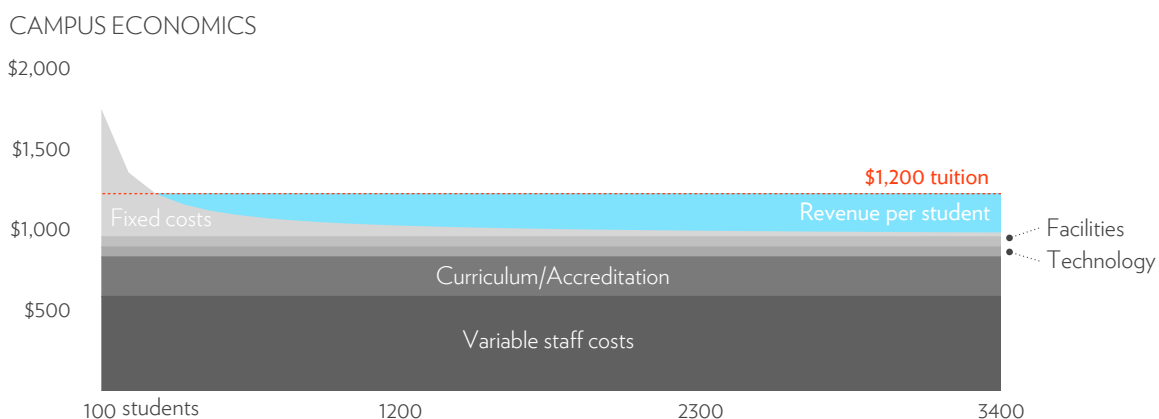
## COST

To succeed, Kepler’s tuition must be priced at a rate that is affordable to a broad, democratic base of students in the developing world. Based on market surveys, we have targeted a tuition of \$1,200 to \$2,500, depending on the country—significantly lower than the price of the country’s top universities in any case. Though price and quality are often in tension, we believe that several of the innovations in instructional design will accomplish both, notably blended learning, competency-based education, employer subsidization, and lean staffing. For Kepler’s complete financial model, see Appendix 1.

**Blended Learning:** In Rwanda, tenured professors earn an average salary of nearly \$60,000, making traditional faculty hiring prohibitively expensive for delivering an affordable degree to students in a country with a per capita income of \$521. By outsourcing lectures and course design to the world’s leading professors on MOOC platforms, we can focus on hiring good teachers, not researchers or experts, who not only can focus on teaching, but command salaries more closely in line with delivering a locally affordable university degree.

**Competency-Based Education:** Because competency-based degrees are self-paced and assessment focused, they remove the need for expensive U.S.-based seat time, allowing institutions to confer degrees in the developing world at locally affordable tuition.

**Employer Subsidization:** Kepler’s internship program is testing an innovative new form of employer buy-in: in exchange for a high-caliber entry-level employee, businesses subsidize the final two years of a student’s tuition. In this way, students will earn while they learn, completing at least one year of full-time apprenticeship with a partner employer before graduation.



**Lean Staffing:** Because students will complete much of the coursework online on their own time, the Teaching Fellows will be flexible enough to take on some administrative roles, reducing overall staffing costs. In addition, as more educational data is moved online, more student data can be managed through learning management systems (LMSs), instead of through large registrar's and administrative offices.

## PILOT M&E MODEL

Kepler's academic model is structured around rigorous and frequent assessment of student performance. We are setting ambitious targets for student outcomes and our staff will be held equally accountable for achieving them. To measure performance, we plan to draw on several recent developments in technology and learning research. Teaching Fellows will use emerging adaptive learning technology and methods to closely track each student's mastery of the material and to tailor instructional techniques and content delivery. Bi-weekly assessments of subject mastery will be conducted, and Teaching Fellows will have custom dashboards to monitor student performance.

Because the results of the Kepler pilot will be highly relevant to future technology-enabled higher education projects in the developing world, we need to be particularly thoughtful about how to measure the success and replicability of the Kepler model in a relatively short timeframe. Educational interventions are optimally measured in years and decades, but we are developing an 18-24 month M&E framework to track short-term indicators of success and failure, specifically related to (1) whether students are reaching academic and professional benchmarks in a timely manner, and (2) whether this is being accomplished in a efficient, scalable, and cost-effective manner.

On an impact level, we are partnering with an external assessment monitor (J-PAL or similar) as well as hiring a Chief Information Officer to begin developing assessments, working with research partners on control trials to test improvements to Kepler's pilot model, evaluate the effectiveness of blended learning and competency-based testing methods, and assess the effectiveness of online platforms. There are limitless avenues for research, but the major impact level research question we will focus on during the first two years is whether Kepler can deliver superior academic outcomes relative to the following groups: (1) traditional university students in Rwanda, and (2) comparable students given free access to laptops, broadband, and MOOCs to earn a SNHU competency-based degree on their own. The first will give us a baseline for whether we truly can deliver a higher quality education at lower cost than local options; the second will test the degree to which high-touch classroom exposure is necessary to reach a satisfactory level of academic development.

Following the pilot, we will assess and modify our M&E practices at all levels (see Appendix 2 for Kepler's full logic model and M&E approach). Over the long term, we plan to pivot our research focus to employment-level outcomes rather than relying exclusively on academic proxies, while also continuing to track student learning profiles, curricular and instructional model efficacy, and subject-based and critical thinking gains—not only to serve our students, but also to add knowledge to the field more generally. We have already been approached by MIT, edX, ID Insight, and University of London about knowledge sharing systems to make data from Kepler's experimental program available to education and global development researchers, and we plan to stimulate demand for data on higher education quality by advocating that nations should actively invest in outcome-focused projects.

## THE KEPLER TEAM

**Jamie Hodari, Chief Executive Officer** — Jamie joined Generation Rwanda from Birch Run Capital, an investment fund in New York City, where he analyzed businesses and served as legal counsel. Prior to joining Birch Run, he was an Associate in the New York office of the law firm Sullivan & Cromwell, where he advised companies in the finance and energy sectors. Jamie also worked as a manager on the Obama campaign, and internationally as a political and economic reporter. He received a J.D. from Yale Law School, an M.P.P. from Harvard University, and a B.A. in Political Science and Anthropology from Columbia University.

**Dai Ellis, Founding Director** — Dai co-founded Generation Rwanda and currently serves as the Chairman of its Board of Directors. He led the Boston-based charter school network Excel Academy as CEO, and previously spent time at the Clinton Health Access Initiative and McKinsey and Company. Dai is a graduate of Harvard University and Yale Law School.

**Charles Rukikanshuro, Country Director** — Charles has been a member of the Generation Rwanda team since 2007 and became the Country Director in 2009. Before joining Generation Rwanda, Charles spent two years serving as a fellow with Rwanda HIV/AIDS Public Interest Fellowship Program supported by Tulane University and worked as a Technical Assistant in a youth and civic education program operated by GTZ, a German NGO. He also worked as the Secretary General of the General Association of Students of the National University of Rwanda. Charles holds an MBA in Project Management, a Bachelor's degree in Law and a Bachelor's degree in English Linguistics; he is fluent in French, English, and Kinyarwanda.

**Melanie Chuen, Chief Operating Officer** — Melanie joins Kepler from Dalberg Global Development Advisors, where as their Director of Global Operations, she led a professional development team spread across Mumbai, Nairobi, and D.C. She previously worked at Lehman Brothers and has a B.A. from Stanford University.

**Joshua Goldstein, Chief Information Officer** — Josh is currently a consultant with the World Bank's Global ICT Department, focused on sub-Saharan Africa. Before this, he worked in research design and open development projects at organizations ranging from Google to UNICEF. Josh is a PhD candidate at Princeton's Woodrow Wilson School of Public and International Affairs.

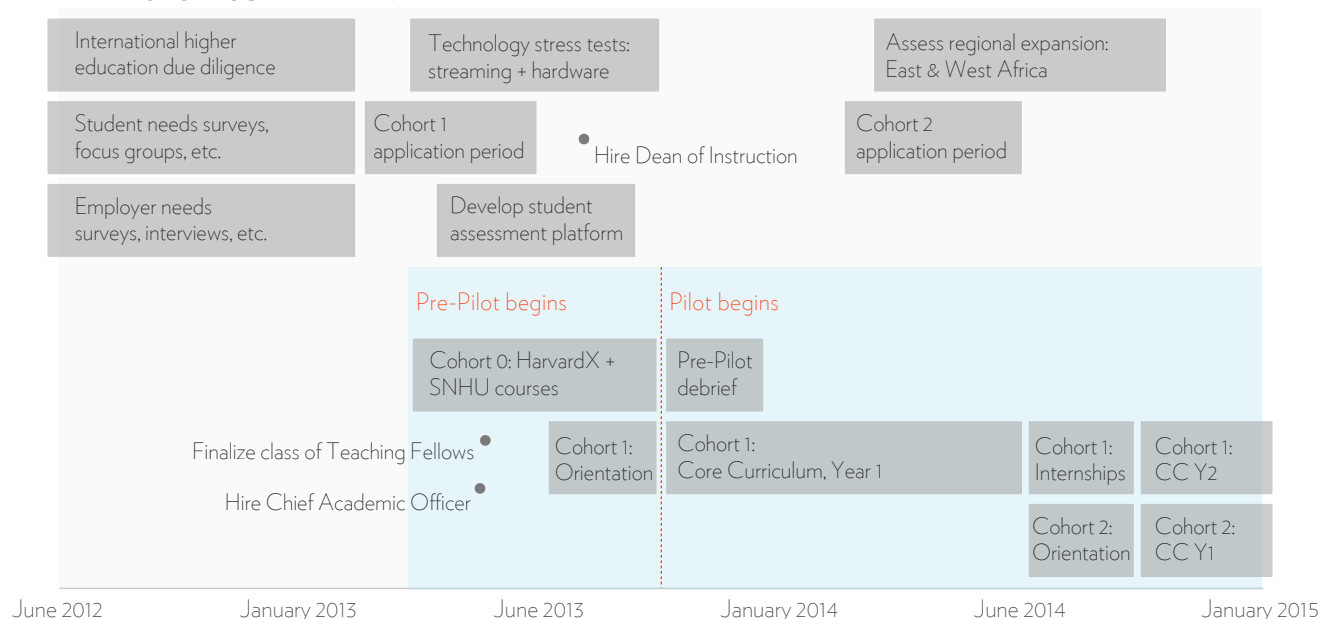
**Alex Hague, Chief Marketing Officer** — Alex came to Generation Rwanda from NRDC, one of America's largest and most effective environmental action groups, where he managed their development communications. Previously, he worked across development and communications at a number of international NGOs, including the Wildlife Conservation Society and the Bill & Melinda Gates Foundation. Alex holds an M.A. in English from Georgetown University and a B.A. in Classics from New College of Florida.

**Sylvia Uhirwa, Chief Employment Officer** — Sylvia holds a Bachelor's degree from Makerere University Business School in Uganda, where she studied Human Resource Management. Previously, she worked in the department of the Rwandan Public Service Commission that is responsible for recruiting staff for government institutions.

**Emma Stellman, Director of Instructional Design** — Emma founded one of the highest-performing schools in Massachusetts, Community Charter School of Cambridge, and was its academic leader for almost a decade, during which she became a recognized expert in data-driven instructional design. Emma received a B.A. in Physics from Bryn Mawr and an M.A. in Education from Stanford University.

**Christine Yarnig, Program Director** — Christine has five years of experience working in traditional public schools and a high-achieving charter school. Most recently, she served as a lead teacher at KIPP Academy of

## KEPLER SHORT SCALE TIMELINE



**Arts & Letters.** As a KIPP and Teach for America alumna, she brings experience with the no-excuses culture and innovations vital to an exceptional learning environment. She holds a B.A. in Anthropology and Policy Studies from Rice University, an M.Ed. in Curriculum & Instruction from UNLV, and a J.D. from UC Berkeley.

**Oliver Sabot, Founding Director** — Oliver served as the Executive Vice President for Global Programs at the Clinton Health Access Initiative, leading the design and execution of large-scale programs to reduce child mortality and transform health systems in over 20 countries. He previously worked at the Global Fund to Fight AIDS, TB and Malaria and chaired a committee of its Board overseeing \$7 billion in health product investments. He is the author of several publications in leading scientific journals and holds a B.A. in Government and History from Colby College.

**Dr. Oliver Rothschild, Founding Director** — Oliver co-founded Generation Rwanda and presently sits on its Board of Directors. He was the Medicaid Chief of Staff for the Commonwealth of Massachusetts and previously worked as an Associate at McKinsey and Company. Oliver is a graduate of the University of Chicago and the Yale University School of Medicine.

The final principal hire will be Kepler's **Chief Academic Officer**. The search is focused on U.S. charter school leaders. For the full organizational chart, see Appendix 3.

## DIRECT & INDIRECT SCALE

There is very little competition in the developing world higher education ecosystem. The elite of the elite attend universities in North America and Europe, and the remainder are served by a handful of locally entrenched public and low-quality private universities.

Kepler's pilot campus will be the first in Rwanda to beat legacy institutions on both cost and quality. While it is clear that demand for this product will exist, a baseline is already forming: during a five week application period in early 2013, we received over 3,000 applications for the 50-student pilot class. As we perfect the educational

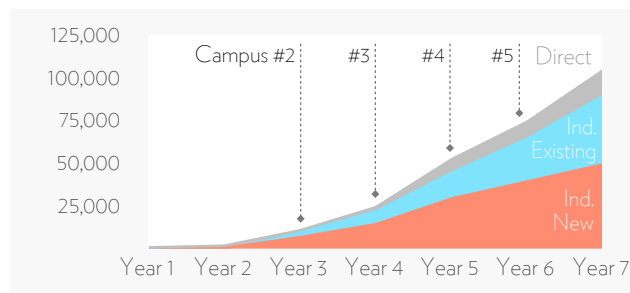
model and students begin to earn prestigious internships and entry-level positions at a significantly lower tuition than existing options, we expect applicants will choose Kepler over local institutions. Public universities face significant cost pressures, and this is even more true in the developing world, where countries spend more per capita on higher education relative to GDP than wealthy countries. We anticipate that these universities will be eager to reduce per student costs by adapting aspects of the Kepler model (blended learning, MOOCs, outsourcing of expert content). We also plan to nudge this process along by advocating locally for more open admissions, access to student lending, and other features that will ultimately democratize education in the developing world.

The second indirect impact of Kepler will be within the NGO and start-up community. Our aspiration is to be the Grameen Bank of higher education: a model that inspires an entire movement of entrepreneurs and social enterprises to found low-cost, high-quality universities. This would likely emerge in some combination of new local educational startups, traditional NGO interventions, and western universities opening branch campuses in Africa and elsewhere in the developing world. The accelerant to rapid growth, as is often the case in shifting markets, is not just the evidence of a successful model, but the rapidly diminishing barriers to entry in higher education that we observe across much of the developing world, combined with the unavoidable explosion in demand for higher education that arrives on the back of young populations with rapidly rising secondary school graduation rates.

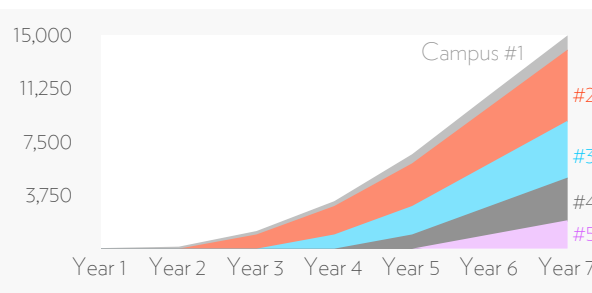
Kepler's ambitions for direct impact are equally large: within 5-7 years, we expect to open five campuses across Africa, with further plans to expand to Latin America and Asia. Our goal is to directly serve 8,000 students by 2017, with an additional 45,000 served by new or reinvigorated existing institutions, and to directly serve 30,000 students by 2022, with 150,000 served by new or reinvigorated existing institutions. To achieve this scale this rapidly, we need to execute effectively on our broader advocacy goals, but more importantly, we need to succeed in putting forth a model for higher education with improved academic and employment outcomes at a highly competitive cost.

In some ways, higher education should be thought of more as a consumer product rather than a traditional development intervention (including much of K-12 education), and universities not only compete with each other, but non-consumption as well. This will punish poorly-priced, inferior institutions in the long run, and it will reward those who can make an effective value proposition to the millions and millions of young students in the developing world looking for a pathway to skills and employment.

DIRECT & INDIRECT IMPACT, # OF STUDENTS



DIRECT IMPACT, # OF STUDENTS



## SUSTAINABILITY

Like many ambitious, innovative, and complicated projects, Kepler requires a significant amount of start-up capital. The vast majority of this startup capital will be focused on hiring educators, curriculum and assessment designers, academic managers with a proven record of excellence, and paying the living expenses of our first cohort. The staff's role will be to expand, experiment, and rapidly iterate our instructional and curricular model. There are all sorts of claims about the transformative power of online education, but Kepler will be the world's first ongoing experiment to see what does and does not work in the context of the developing world.

Unlike many ambitious, innovative, and complicated projects, Kepler has a clear path to financial sustainability. Once the early investments in building a highly effective four-year degree have been made, the ongoing cost per student at a Kepler campus will be \$1,000, and the marginal cost per student will be significantly below that. As focused as Kepler will be on quality, we will be equally cost-focused, with a target cost per student that we cannot go beyond if we are to succeed. In addition to outsourcing lectures to online platforms, we also will follow the model of several successful schools around the world in having educators in dual-operational leadership roles, minimizing administrative costs. At our target tuition, Kepler will be available to an extremely broad base of students, regardless of their financial background.

We have also begun working with banks in the region to promote student lending. Based on our experience at Generation Rwanda, the average starting salary for a Kepler graduate will be roughly \$5,000 per year—an amount where students could easily carry a reasonable debt burden. Presently, banks will not lend against higher education in East Africa because graduation rates are so low and youth unemployment so high that it would not be profitable. One of Kepler's goals is to provide sufficiently superior professional outcomes to stimulate student lending. With lower costs and a track record of graduate success, one of Kepler's largest impacts could be opening the floodgates of investment in affordable education across Africa.

## CONCLUSION

Kepler presents an extraordinary opportunity to use recent innovations in technology and education to end the stagnation of higher education in the developing world. Every year, millions of brilliant, ambitious students graduate from secondary school with no path to the careers they deserve, while employers search in vain to fill high-skill positions with local talent. Kepler is designed to bridge this divide, and will be the first serious test of whether online content can deliver on its promise to affordably train students for globally competitive careers.

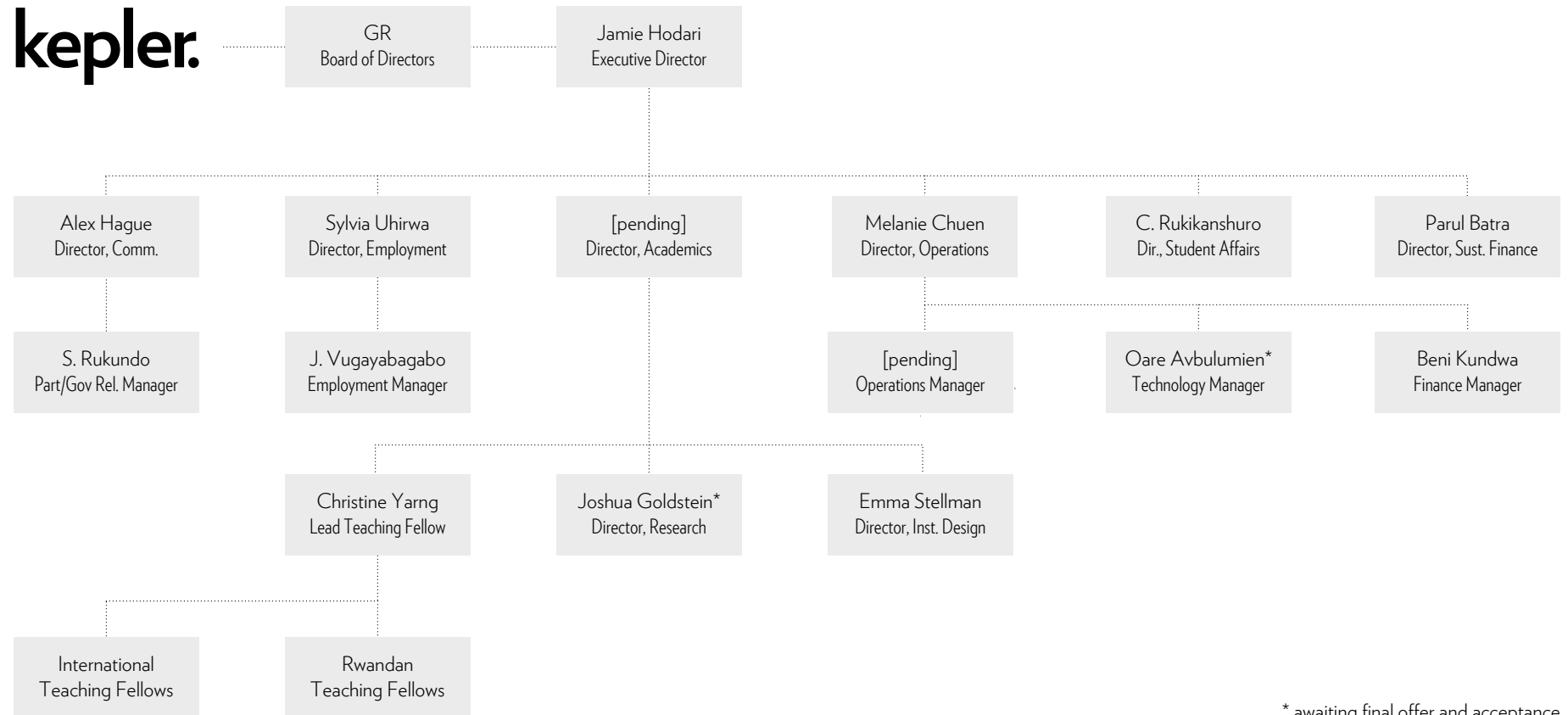
A challenge of this magnitude requires a new model of university, and Kepler's success could provide the solution for how to educate the millions of students around the world that have the greatest potential but not the financial means to fulfill their vocation in life.



## Appendix 2: Kepler Logic Model

RESOURCES	ACTIVITIES	OUTPUTS	OUTCOMES
Educational staff and Teaching Fellows to run and iterate an experimental university project	Facilitate a blended learning model that combines online content with in-person participation	Kepler students graduate from SNHU's AA program within two years	Graduates employed within six months of graduation
A Board of Directors with a close connection to educational interventions in the developing world	Deliver Core Curriculum, e.g. SNHU, Khan Academy and other online resources	Kepler students graduate with a B.A. within four years	Graduates flexibly employed throughout their career, transition between fields if necessary
Funding from individuals, institutions, and potentially tuition revenue	Deliver Specialized Majors Curriculum, e.g. MOOCs and partner university content	Graduates are highly competent	Graduates advance within their fields
Partner organizations to deliver affordable online content, e.g. Coursera, edX, & SNHU	Deliver Workplace Learning Curriculum, e.g. internships and job placement	Graduates are analytical thinkers	Graduates engage in active, thoughtful citizenship
Sufficient hardware and network capabilities for students to stream lectures and complete online assignments	Deliver Professional Practices Curriculum, e.g. resume writing, time management	Graduates meet international standards of professionalism	.....
Learning Management Systems to administer, document, track, report, and deliver content.	Deliver collaborative living facilities, i.e. dorms	Graduates are experts in their fields	Increase in supply of and demand for high-quality staffing in knowledge sector
Students in the developing world interested in attending an experimental educational institution	Generate M&E on the successes and failures of Kepler project	Kepler model demonstrates how to deliver a low-cost, high-quality local degree for developing world students	Increase in demand for high quality, low-cost, outcome-focused higher education
			Increase in supply of high quality, low-cost, outcome-focused higher education

## Appendix 3: Kepler Organizational Chart



## Appendix 4:

### SNHU's College for America Competencies

The following is the complete list of competencies that Kepler students will have to demonstrate during Years 1 & 2 of the program. Passage will result in an A.A. degree from Southern New Hampshire University before beginning the bachelor's portion of the program in Years 3 & 4.

#### **Communications**

- Can give and follow multi-step verbal instructions
- Can identify and summarize the main ideas and key information in a work-related or general interest talk or lecture
- Can identify and summarize the main ideas and key information in an academic lecture
- Can demonstrate active listening skills in one-to-one or small group contexts
- Can listen effectively to understand speaker's values, attitudes and intentions
- Can read critically in order to identify main ideas, supporting evidence, and conclusions
- Can analyze, synthesize and evaluate argumentative texts
- Can locate, evaluate and integrate information from multiple sources
- Can identify and summarize the main points of a text
- Can give an oral description of his or her experience or background
- Can give an informational presentation on a general interest topic
- Can speak effectively in order to persuade or motivate
- Can give a brief oral presentation using PowerPoint
- Can give an extended oral presentation using PowerPoint
- Can demonstrate nonverbal behavior that supports the verbal message
- Can write a paragraph
- Can write a 5-paragraph essay
- Can research a topic of general interest and summarize findings in writing
- Can research an academic topic and summarize findings in writing
- Can critique and edit his/her own writing
- Can provide constructive criticism on peer writing
- Can give and follow multi-step written instructions
- Can write a business memo
- Can write a resume
- Can write a cover letter
- Can analyze a problem and present recommendations in writing
- Can produce a formal research report
- Can write an appropriately researched and documented argumentative text
- Can create a brief PowerPoint presentation
- Can create an extended PowerPoint presentation
- Can document sources appropriately
- Can produce an extended piece of writing
- Can use standard syntax and sentence structure; correct spelling, punctuation, and capitalization; appropriate grammar
- Can use appropriate language, tone and word choice for the target audience

#### **Quantitative Reasoning**

- Can add, subtract, multiply and divide with whole numbers, fractions, decimals, and percents
- Can calculate averages, ratios, proportions and rates
- Can use calculator to perform a variety of functions

- Can use a spreadsheet to perform a variety of calculations
- Can create and use a budget
- Can represent practical problems as mathematical expressions
- Can make financial decisions using appropriate mathematical formula(s)
- Can explain and apply basic concepts of statistics and probability
- Can convey information by creating charts and graphs
- Can interpret and use information contained in graphs and charts
- Can use measurements of time, temperature, distance, length, width, height, perimeter, area, volume, weight, velocity

### **Critical and Creative Thinking**

- Can evaluate competing causal explanations
- Can evaluate data for consistency with facts, hypotheses or methods
- Can recognize flaws and inconsistencies in an argument
- Can generate original, innovative solutions to problems
- Can reflect critically on his or her own experience
- Can reflect critically on his or her learning experiences and processes
- Can formulate clarifying questions that lead to better understanding
- Can generate a variety of approaches to addressing a problem
- Can piece together seemingly unrelated data to identify patterns and trends and to see the bigger picture
- Can distinguish fact from opinion

### **Digital Fluency and Information Literacy**

- Can synthesize, summarize, compare and contrast information from multiple digital sources
- Can formulate a search and access needed information effectively and efficiently
- Can evaluate information and its sources critically
- Can use information effectively to accomplish a specific purpose
- Can recognize the economic, legal, and social issues surrounding the use of information
- Can access and use information ethically and legally
- Can create and upload graphics, video and other media
- Can use a graphics or artwork package to manipulate an image
- Can use social media to accomplish educational and business purposes

### **Teamwork and Collaboration**

- Can work with others to accomplish a task
- Can negotiate with others to resolve conflicts and settle disputes
- Can give and receive feedback
- Can listen to and consider others' viewpoints, demonstrating sensitivity and respect for other perspectives
- Can motivate others to work effectively as a team
- Can persuasively present thoughts and ideas
- Can serve as team leader or member, depending on team needs

### **Ethics and Social Responsibility**

- Can recognize and articulate the ethical and moral implications of an issue
- Can describe major traditions in moral philosophy
- Can analyze and evaluate the strengths and weaknesses of ethical arguments
- Can identify and analyze ethical issues presented by market-based economic systems
- Can identify and analyze ethical issues presented by scientific and technologic developments
- Can identify and analyze ethical issues presented by social and mass media

- Can identify key figures in the field of moral philosophy and explain their views

### **Personal Effectiveness**

- Can work independently to accomplish a task
- Can ask for help when necessary
- Can plan and organize work, including setting and meeting deadlines
- Can reflect on and describe personal and professional interests
- Can develop and follow a plan to accomplish academic goals
- Can create personal and professional networks

### **Business**

- Can define and use marketing terminology and concepts
- Can describe and explain how political, economic and social-cultural factors affect decision-making
- Can identify and explain basic theoretical economic principles
- Can identify and explain basic marketing strategies
- Can identify and explain marketing issues that arise in a global environment
- Can describe and apply strategic, tactical and operational planning processes
- Can describe and explain interaction skills that contribute directly to effective human resources management
- Can describe the role of human resource management in organizations
- Can identify and explain major global and domestic developments and trends in business
- Can identify and explain the meaning of corporate social responsibility in different historical, cultural and societal contexts
- Can apply basic economic theory and principles of finance to analyze basic consumer decisions
- Can analyze current macroeconomic and financial news
- Can use logic, reasoning and analysis to address a business problem
- Can locate and use information in basic business documents, such as manuals and reports

### **Science, Society and Culture**

- Can define, explain and use fundamental anthropological terms, concepts and theories
- Can define and explain the procedures that anthropologists use in studying cultures
- Can explain the major factors involved in cultural change
- Can analyze works of art in terms of their historical and cultural contexts
- Can analyze works of art in terms of their subject matter and style
- Can communicate ideas about art using appropriate terminology
- Can communicate ideas about literature using appropriate terminology
- Can identify the distinctive quality of texts from diverse places, cultures and time periods
- Can identify commonalities in texts from different places, cultures and time periods
- Can support interpretations and analyses of literary texts with textual evidence
- Can identify and explain the elements of scientific method
- Can define and explain fundamental psychological terms and concepts in the main areas of psychology
- Can identify and describe natural processes that affect humans
- Can identify and explain the basic principles of environmental science
- Can identify major environmental problems
- Can analyze and critique leading solutions to major environmental problems
- Can apply fundamental psychological terms and concepts to self and others
- Can recognize both correct and faulty applications of psychological principles and theory
- Can analyze the effect of various mass media on individual and societal thinking and decision-making
- Can define, explain and use mass media terms and concepts
- Can critique and evaluate mass mediated messages
- Can describe the history and development of different mass media