

Higher Education Online and the Developing World

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Abstract

Higher education has an enormous potential to provide economic opportunities and career advancement for people in developing countries. Technology and the Internet can help reach the billion people who will be looking for affordable access to college instruction in the next few decades. Two promising strategies for serving this population are a for-credit version of a massive open online classes (or MOOC), and a microcampus where American universities partner with universities in the developing world to offer dual degree programs. Although MOOCs started as free courses for lifelong adult learners the mechanisms now exist for them to offer transferrable college credit. The microcampus mechanism offers highly scalable college education using a flipped classroom model. Both ideas hold out the promise of helping to democratize higher education and spread its economic benefits more widely.

Keywords: higher education, online classes, microcampus, career advancement, developing countries, economic opportunity

1. Background

While there is legitimate concern about poverty and conflict around the world, the past few decades have seen one stunning success: the number of people living in extreme poverty has fallen by a factor of two, even as the world population has doubled (World Bank 2016). Education plays a crucial role in this story since school participation and learning outcomes correlate with gross domestic product (GDP) per capita. (Data presented in Figure 1 shows that standard school test scores, across subjects and grade levels, correlate well with GDP per capita (Altinok, Angrist, and Patrinos, 2018). Separate research shows that the correlation persists after controlling for baselines of schooling and GDP. Therefore, skills training incrementally boost economic advancement (Hanushek and Woessmann 2010).

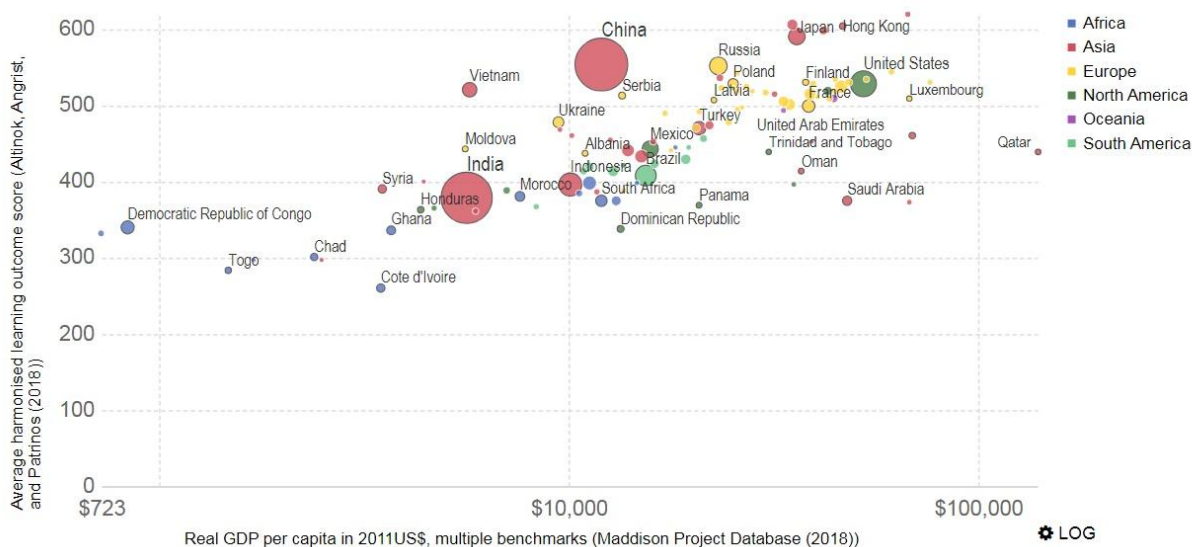


Figure 1. Standard school test scores, across subjects and grade levels, correlate well with GDP per capita (Altinok, Angrist, and Patrinos, 2018).

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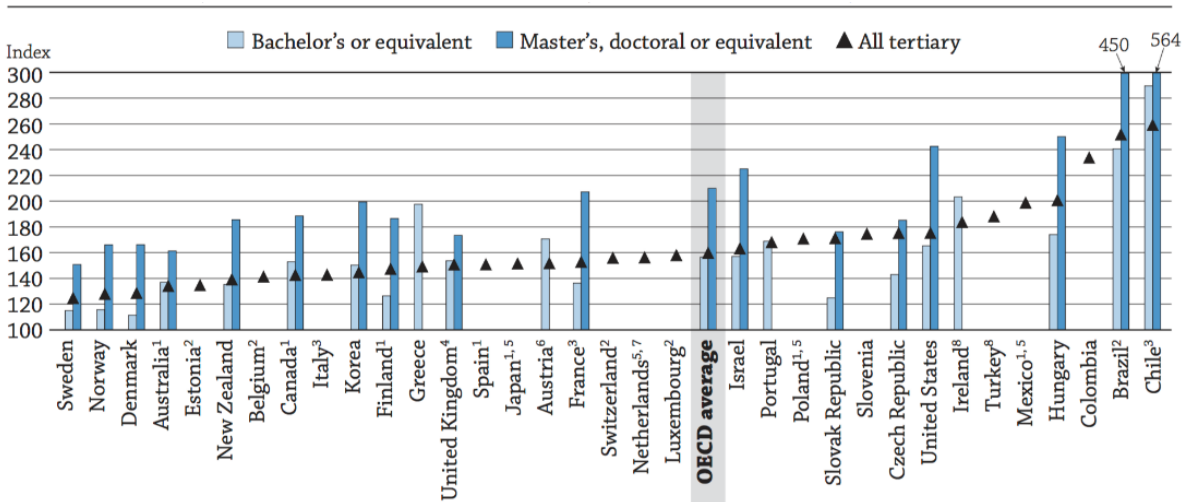


Figure 2. Relative earnings of workers, by their level of tertiary education (OECD 2015).

Projected world population by level of education

This visualization shows the Medium projection by the International Institute for Applied Systems Analysis (IIASA). The researchers who created this projection describe it as their "middle of the road scenario that can also be seen as the most likely path".

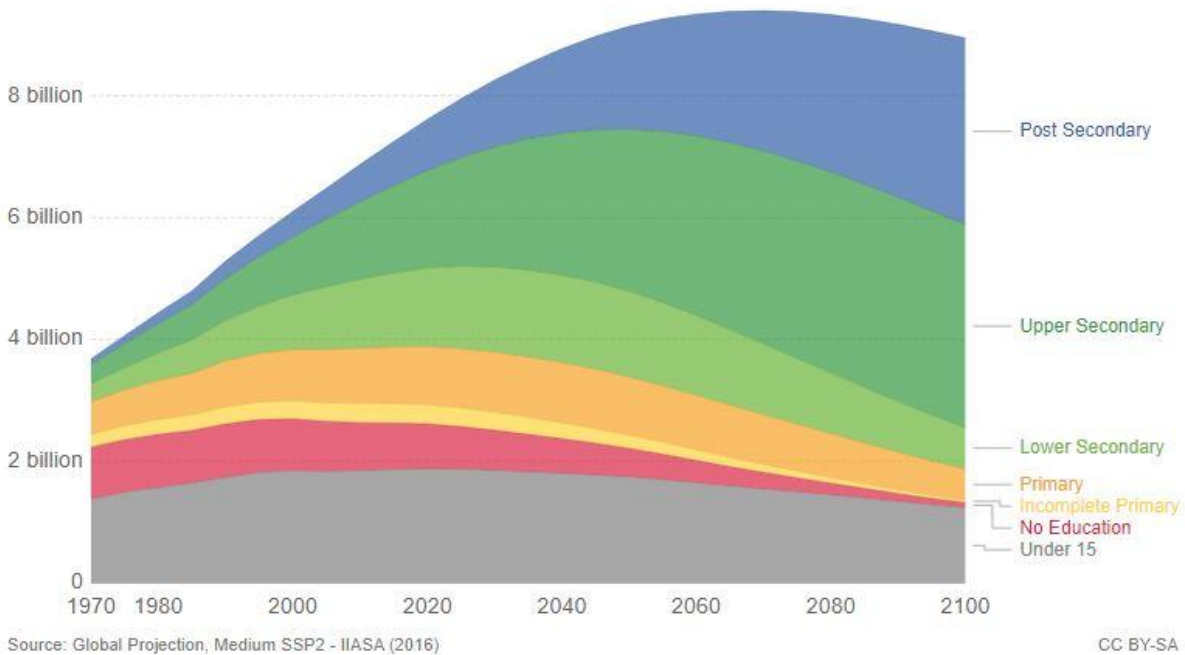


Figure 3. Visualization of the projected world population by level of education through 2100, from the Wittgenstein Center for Demography and Global Human Capital (2015).

Higher or tertiary education plays a crucial role in economic development. Data show that higher levels of education correlate with higher earnings across all countries within the OECD, or the Organization for Economic Cooperation and Development (see Figure 2). A persuasive argument for causation underlying this correlation has been made by Card (1999). In the United States, the impact of higher education is dramatic. Since 1964, the wages of those with a Bachelor's degree have grown by 50%, while wages for those without a degree have stagnated. With education beyond a Bachelor's degree, the gain is even greater, about 90% (Autor, 2014). Higher education presents a huge opportunity for economic development since the global participation rate is still low. The number of people continuing to post-secondary education has grown from 100 million in 1970 (or 3% of the world population) to 725 million in 2015 (or 10% of the world population). That still leaves 700 million children graduating from high school without any access to higher education, mostly in developing countries (see Figure 3). Population projections suggest that the worldwide demand for higher education will be two billion people by the year 2060 (Roser and Ortiz-Ospina 2018).

Science, technology, engineering, and math (STEM) education play a very important role in economic development, due to the financial benefit to individuals in their future earnings and the benefit to countries in filling jobs that fuel growth (Goldemberg, 2003, but also see Kramer et al., 2010). However, to fulfill this promise, STEM training must close a persistent “gender gap.” If educational systems can do this, the boost to women’s earnings in developing countries over the next ten years will be \$300 billion (World Economic Forum 2016).

2. The Rise of Online Learning

Higher education has leveraged and benefited from advances in technologies since the birth of the Internet. The net effect has been to erode the “sense of place” that has been the core of a traditional college experience. Technology landmarks on this path include the first packet switching network in 1973, the first use of email in 1984, and the creation of the first web site in 1991 (Ryan, 2010). The first online class was offered in 1960 by the University of Illinois, nine years before the birth of the Internet. Fully online university classes have increased rapidly in number and scope (NCES, 2011). Major technology companies are now involved, with Apple launching its iTunes U in 2006 and Google’s YouTube launching their education channel in 2009. About 70% of American college students take some classes online and 13% take all of their classes online (Babson, 2018). Fewer than 1% of the students pursuing online degrees are based overseas.

Another important development was the birth of massive open online classes (MOOCs) in 2012. MOOCs are typically free and not for credit. The major providers are Coursera, edX, and Udacity, and from an initial base in technical subjects, courses have spread to the social sciences and humanities (see Figure 4). Revenue comes mostly from completion certificates, although there is a recent trend towards tuition-bearing courses and online degrees. Over 100 million students worldwide have enrolled in at least one MOOC. The providers are no longer based exclusively in the United States; over a quarter of new MOOC users in 2017 came from regional providers located in China (i.e. Xuetang) and in Latin America (i.e. Miriada). The Achilles heel of MOOCs is their generally low completion rates, around 5-10% (Reich and Ruiperez-Valiente, 2019), but such a low level is to be expected in a free-choice learning environment, where typical learners are adults with jobs, families, and busy lives.

CLASS CENTRAL

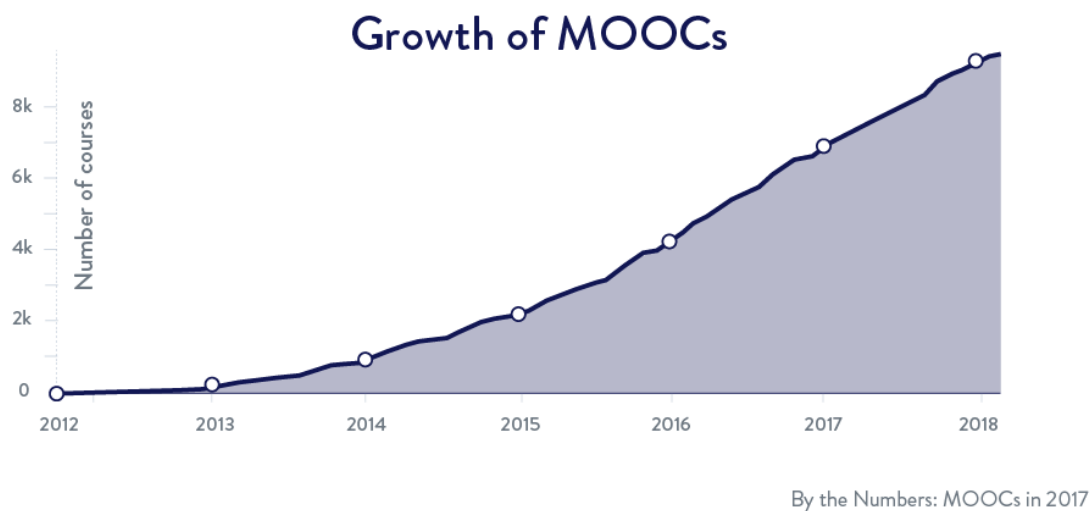


Figure 4. The number of massive open online classes in the United States from their inception in 2012. About 23 million new learners are added each year (Class Central 2018).

3. Higher Education in the Developing World

Higher education leads to economic advancement for the individual and the creation of universities as a “public good” in developing counties boosts their economies. However, national governments and international donors continue to assign higher education a low priority. The situation was succinctly described in a report by the World Bank (2010):

“Higher education systems in developing countries are under great strain. They are chronically underfunded, but face escalating demand—half of today’s higher education students live in the developing world. Faculty are often underqualified, lack motivation, and are poorly rewarded. Students are poorly taught and curricula are underdeveloped.”

Developed countries, meanwhile, are constantly raising the stakes. Quite simply, many developing countries will need to work much harder just to maintain their position, let alone catch up. Currently, across most of the developing world, the potential of higher education to promote development is being realized only marginally.”

The context for using instructional technology and online learning to advance higher education in poorer countries is the spread of the Internet worldwide. In developing countries, smartphone usage and Internet access is growing more rapidly than GDP (Pew Research Center, 2016). For the first time, more than half the world’s population can get online. Although Africa and South Asia continue to lag, the digital divide between rich and poor countries is steadily shrinking with the spread of mobile Internet access (see Figure 5). High-quality online education can now be delivered to remote regions with video lectures, interactive simulations, discussion forums, evaluation of learning that includes customized feedback to learners, and the judicious use of social media. It’s potential is enormous (Trines, 2018).

Two-thirds worldwide use the internet, but fewer do in Africa and South Asia

Percent of adults who use the internet at least occasionally or report owning a smartphone

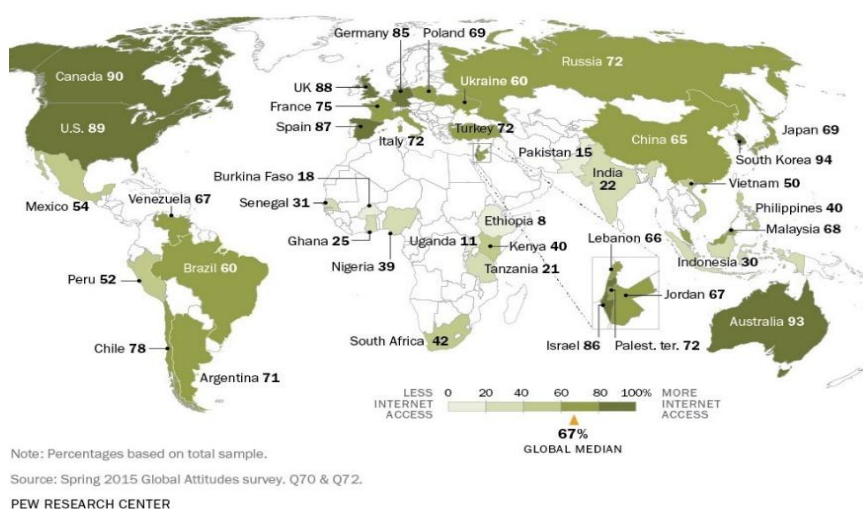


Figure 5. Global Internet access is growing rapidly, but a digital gap still exists between the Americas and Europe on the one hand, and Africa and South Asia on the other (Pew Research Center, 2016).

3.1 Massive Open Online Classes

MOOCs have untapped potential to advance the education and aspirations of citizens in poorer countries. They hold out the ideal of the democratization of education since high-quality instructional materials at prominent Western universities are available to anyone with an Internet connection. Analysis of data from nearly half a million students taking 13 MOOCs in 2013 shows that the typical student is 28 years old and has a Bachelor’s degree. The United States accounts for 1/3 of the online students, with India second, and a long tail of dozens of countries after that (Wolf, 2014). The completion rates of students vary by country, with the seven highest completion rates among European countries (see Figure 6).

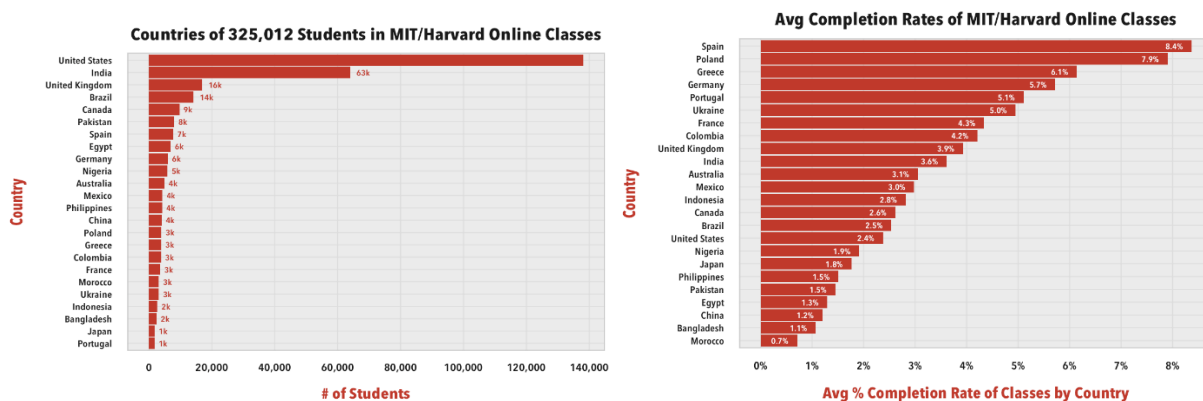


Figure 6. Countries of students in 13 Harvard and MIT MOOCs offered in 2013 (left), and average completion rate for those courses by country or origin (right, from Wolf, 2014).

Research on MOOCs from Coursera has illuminated the reasons why people take these classes, and how they perceive the benefits. From a survey of 780,000 people who took MOOCs with Coursera, half have the primary goal of improving their current job or finding a new job (Zhenghao et al., 2015). They are classified as “career builders.” Nearly 90% of the career builders reported benefits from taking a MOOC. MOOC enrollees are well-educated adults in developed countries, who are expected to derive the most benefits from MOOCs. Interestingly, the data suggest a different conclusion. In rich countries, career builders with low socioeconomic status and lower levels of education report tangible career benefits at the same rate as those with high status and a high level of education. However, in developing countries, people with a lower socioeconomic status and a lower level of education are *more* likely to report career benefits (see Figure 7).

Another study of a different set of Coursera MOOCs compared learners who said they were unable to afford a formal education to a larger comparison sample. Even though they were less well-educated, the financially challenged students earned certificates of distinction at a higher rate than the students in the comparison sample (Dillahunt et al., 2014). An equally encouraging report is by “The Advancing MOOCs for Development” initiative at the University of Washington (Garrido, Koepke, and Anderson, 2016). This was the first study to include multiple MOOC providers in the developing world. Low- and middle-income populations make up 80% of these MOOC users, in contrast to the users in the United States and Western Europe. Despite lower levels of education, half of the participants in developing countries received a MOOC certification, and another third completed the course, levels far higher than the single digits reported in the United States. Women are more likely than men to get a certification or complete the course. These results suggest that as MOOC credentials become more formalized and widespread, these online courses can play an important role in career advancement in developing countries and in advancing equity between men and women.

Who’s Getting Ahead at Work Because of MOOCs?

Tangible career benefits reported by those who stated such benefits as their primary reason for completing a MOOC.

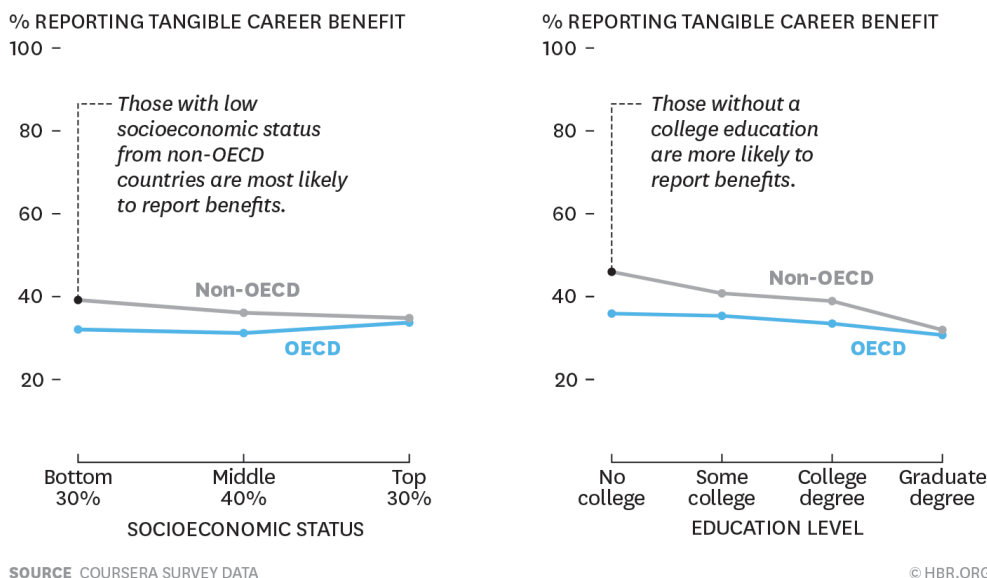


Figure 7. In developing countries, the benefit of a MOOC to a career is strongest for those of low socioeconomic status and without much education (Zhenghao et al. 2015).

3.2 Microcampus Initiatives

Higher education has developed unevenly through the world, with levels of attendance below 5% in parts of South Asia and sub-Saharan Africa (Ilie and Rose, 2016). Over 700 million people in the developing world are without easy access to the benefits accruing from college-level training. The cost of an American college education far exceeds the yearly income of most people in developing countries and so is far beyond reach. Universities have set up international branch campuses in the past few decades. However, the cost and risk associated with these ventures means they are increasingly located in wealthy countries; several examples include Education City in Qatar and Knowledge Village in the United Arab Emirates (Kinser and Lane, 2016).

International students can come to the United States to study, but they generally pay the highest rate of tuition, with few scholarships available. A different model is required for the American college experience to reach more than a few privileged or wealthy students in developing countries.

A promising new concept is the microcampus, a hub with an American university “brand” hosted by a partner university in a foreign country. Rather than being a fully-fledged branch campus, it is a much more economical building that can be used for teaching classes or labs, advising, and hosting exchange visitors, both faculty and students. The goal is to create a basis for sustainable internationalization of teaching and research. There are two key ingredients in this model. One is the dual degree. Foreign students remain in their home country while taking classes that earn credit at the American university. At the end of four years, or after completing their studies, they earn a Bachelor’s degree in the same subject at both their home institution and at the American institution. Dual degree programs have been popular in Europe for decades and are increasingly popular in the United States (American Council on Education, 2014). Most dual degree programs are at the graduate level and enrollments are small, typically 25 or less (Obst, Kuder, and Banks, 2011). The most popular degree subjects are business and management, math, science, engineering, and social science. That landscape, along with the distribution of the most prominent partner countries, is illustrated in Figure 8.

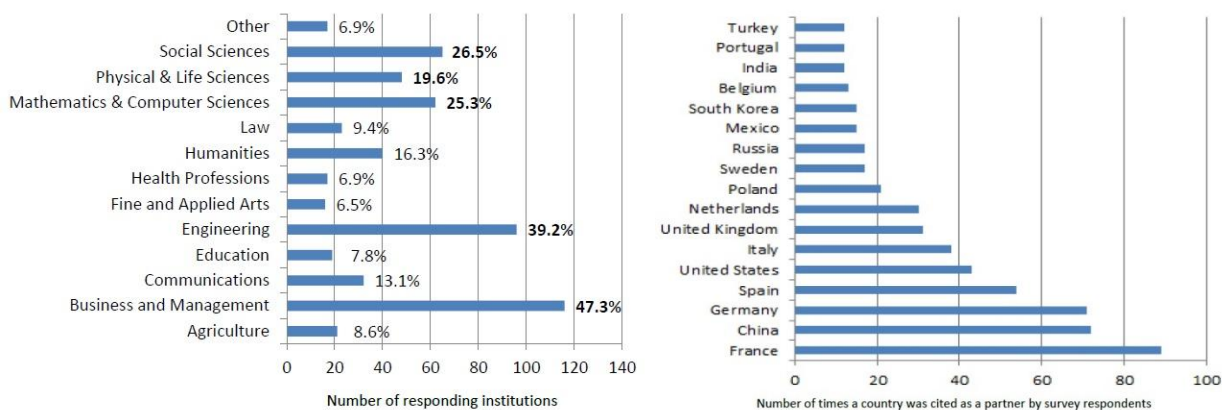


Figure 8. Distribution of the most popular degree subjects (left) and the most prominent partner countries (right) from an international survey of dual degree programs (Obst, Kuder, and Banks, 2011).

The second ingredient is a “flipped” classroom model. The foreign students watch video lectures online outside of class time, created by a U.S. university instructor, or professor. They are taught by a co-professor at their home institution who run labs and discussion sessions, and who fosters collaboration among the students. The two professors jointly design the class and award grades. The online classes can leverage technology so the pedagogy is interactive and student-centered. Most foreign students who benefit from a dual degree stay in their home country, so the idea does not cause loss of local talent.

The financial model of a microcampus is favorable for all parties involved. Very little new infrastructure is needed, so the startup costs of a new partnership are minimal. Foreign students pay tuition at their local university, thus avoiding the costs of living abroad and paying the high tuition of a university in the United States. Tuition at local market rates means this is an affordable model in developing countries. Half of the tuition goes to pay the salary or stipends for the American professor who provides the online course, and the other half pays the co-instructor and other local costs in the foreign partner country. A minimum yearly cohort for a viable financial model is about 25 to 30. The model scales very favorably; as partner campuses are added, marginal costs are modest since all the course material has already been developed and is online. Science is an excellent focus for this program because many of the foundational classes are already online, and scientific research is being conducted in many of the countries interested in partnering on a new microcampus. Students move among the locations and each microcampus acts as a hub for education and research.

4. Discussion

Higher education in the industrialized West is suffering serious stresses. One aspect is the tension between the need for prestigious universities to fulfill their public mission while they strive for research excellence (Morphew, Fumasoli, and Stensaker, 2016). In Europe, growing enrollments have put a strain on university infrastructure and the demand for highly educated labor has not kept pace with the supply (Davia, McGuinness, and O’Connell, 2017).

In the United States, rising tuition and the corresponding student debt have created a crushing and unsustainable burden for college graduates as they embark on their careers (Zaloom, 2018, Chakrabarti et al., 2020). Financial pressures have deepened for all universities due to the COVID-19 pandemic and ensuing economic recession.

This article seeks to counter the understandable gloom by presenting a landscape of new opportunities, where universities in industrialized can increase human capital in the developing world by spreading their brand of higher education in affordable forms. MOOCs are already generating new economic models for higher education (Belleflamme and Jacqmin, 2016). It doesn't follow automatically that the highly scalable MOOC model can break the curve of increasing tuition, but the entrepreneurial educational landscape in the United States almost ensures that low-cost experiments will emerge, and they will be eagerly adopted in developing countries (Ruth, 2014). The challenge is to ensure that training talent in poorer countries doesn't lead to a brain drain and so compromise their economic development (Docquier and Machado, 2015, Wasti, 2018). Early indications from microcampus programs are that most of the people receiving an American standard of higher education do not leave their home countries. One of the silver linings of the emptying of American campuses due to the pandemic is an acceleration of the development of online and hybrid classes. The pump has been primed for the spread of distance higher education in the developing world.

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