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Higher Education and Modernization of the Economy:
Innovative and Entrepreneurial Universities

CONFERENCE PROCEEDINGS

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PREFACE

Kairat Kurakbayev and Aida Sagintayeva

The fifth Eurasian Higher Education Leaders' Forum and its themed conference proceedings, "Higher Education and Modernization of the Economy: Innovative and Entrepreneurial Universities," could not have come at a more appropriate time as policy makers, higher education leaders, faculties, practitioners and other stakeholders are discussing different models of higher education institutions with the "entrepreneurial university" becoming a key focus. The development of entrepreneurship education *per se* has been supported by the Global Entrepreneurship Monitor (GEM), an international group of researchers that conducts the world's foremost study of entrepreneurship since 1999. Initially starting with the aim of considering why some countries are more 'entrepreneurial' than others, the GEM report is now in its 18th consecutive year. The report points out that "the GEM countries in the 2016 survey cover 69.2 per cent of the world's population and 84.9 per cent of the world's GDP" (Global Entrepreneurship Monitor, 2016). Concerns are expressed on the part of higher education leaders around the world about how to respond to globalization of the modern knowledge economy, as many universities in post-Soviet states are revisiting their roles and missions.

While the society expects universities around the world to come out of their shadows to fulfil their third mission activities and commercialize their research, academic institutions and their leaders are finding themselves in the demand-and-response imbalance (Clark, 1998). As Clark puts it, "national systems of higher education can neither count on returning to any earlier steady state nor on achieving a new stage of equilibrium. (…) Universities are caught in a cross-fire of expectations. And all the channels of demand exhibit a high rate of change" (1998, p. 6). Etzkowitz amplifies the issue stating that "governments are offering incentives, on the one hand, and pressing academic institutions, on the other, to go beyond performing the traditional functions of cultural memory, education and research, and make a more direct contribution to "wealth creation" (1995, p. 1). Understanding that the policy trend of 'entrepreneurial university' adds to the institutional complexity of modern universities, the European Commission alongside the OECD have developed the Guiding Framework for Entrepreneurial Universities "(…) aimed at those European universities looking for advice, ideas and inspiration for the effective management of institutional and cultural change" (EC-OECD, 2012, p. 1).

As in much of the world, universities of the post-Soviet era are expected to go through transformational change to be able to play a more active role in community engagement and demonstrate a societal impact. Following the rhetoric of Western academic models of the 'research' and 'entrepreneurial' university, higher education institutions of the post-Soviet context have much to learn and at the same time to unlearn in order to be able to develop and sustain a triple helix model of academic – industry – government relations. For example, central to these proceedings' theme, one thing Kazakhstan's higher education institutions need to learn is developing a strategy for integrating science and industry. With an array of state programs established to stimulate socio-economic development of the nation, public universities in Kazakhstan are functioning in an environment geared towards organizational change. More specifically, for instance, the State Program for Industrial Innovative Development of the Republic of Kazakhstan for 2015–2019 places a special emphasis on the integration of science and industry where the development of qualified human resources plays a crucial

role. Now the state is heavily investing into strategic collaboration between local universities and their international peers with the purpose of developing academic programs to prepare graduates qualified to work in the areas of information technologies, oil & gas industry, electrical energy, space industry, food industry and metallurgy – all considered a high priority on the national agenda.

State-funded international collaboration between universities for the sake of developing industry-focused academic programs is an emerging pattern of intensive interaction between university, industry and government. This pattern brings about institutional and cultural change at academic institutions. At the same time, adopting an emergent entrepreneurial paradigm is more easily said than done. Moreover, as Kirby points out, "unlike many large private sector corporations, most [universities] have never had to be entrepreneurial and are not based on a tradition of enterprise" (2006, p. 599). Therefore, it is worth noting that even established universities are likely to find it challenging to develop academic entrepreneurship on their campuses.

Goals and challenges behind the development of Entrepreneurial University relate to context-specific characteristics of a particular academic institution based in its national and international environment. In the case of higher education institutions of post-Soviet states, embedded in different patterns of centralized governance, adopting an entrepreneurial role is likely to be challenging, as academic entrepreneurship means ownership of ideas and engagement with industry without any institutional or cultural barriers. Given that an entrepreneurial university is first and foremost a self-regulating institution, this links directly to issues associated with university autonomy and accountability in higher education governance, policy reform topics now widely discussed in many parts of the world including post-Soviet states (Hartley et al., 2016). Thus, granting autonomy to higher education institutions is an important step forward on the way to academic entrepreneurship, yet one that exposes the need for new conceptions of leadership. As Clark reminds us, "universities need autonomy but they also need to develop entrepreneurial leadership to put that autonomy to effective use" (2001, p. 19). Clark goes on to call for "active autonomy" which in the context of the entrepreneurial university is very different from the passive type" (2001, p. 19), where leadership could respond effectively to increased pressure from the state and trustees to act commercially and generate funds via institutional transfer of research development and spin-off companies.

In sum, as globalization of the knowledge economy highlights the importance of innovation and entrepreneurship, the state and society call on universities to transform their traditional roles and adopt a more entrepreneurial paradigm in response (Etzkowitz et al., 2000). This transformation, difficult in any context, takes on unique complexity in post-Soviet, Kazakhstani context characterized by barriers related to the need for control, limited institutional autonomy, the conservatism of the corporate culture, and a lack of entrepreneurial talent (Kirby, 2006). The chapters of these proceedings speak to these issues of developing academic entrepreneurship in Kazakhstan, and more importantly they explore institutional and cultural changes happening or foreseen on university campuses.

An academic institution aspiring to be an intellectual enterprise has its own story and recipe of how to start to commercialize university-based activities, innovate and engage with the community. In these conference proceedings, President of Tel-Aviv University (TAU), a public, state-funded, highly regulated institution, as the author puts it, Joseph Klafter (chapter 1), identifies six core ingredients of fostering innovation and entrepreneurship in universities. Taking the case of TAU, Professor Klafter eloquently outlines essential elements

and characteristics of successful academic entrepreneurship with experimentation and risk taking, institutional freedom, bridging academia and industry and international collaboration among them. He also raises a point of interdisciplinary collaboration and the importance of university's determination to break down the walls that separate different fields and disciplines.

Straightforward recommendations on developing entrepreneurial universities, as proposed by many scholars and authors, necessitate a university-based entrepreneurship ecosystem development. For instance, Greene et al. (2010, p. 1) are adamant that "a university-based entrepreneurship ecosystem is integrated and comprehensive, connects teaching, research and outreach, and is woven into the fabric of the entire university and its extended community for the purpose of fostering entrepreneurial thought and action throughout the system" (2010, p. 1). As pointed out by Assylbek Kozhakhmetov, Nina Nikiforova and Sholpan Maralbayeva (chapter 2), creation of an effective entrepreneurial ecosystem is a sine qua non of entrepreneurial universities' successful engagement with the community on national and regional levels. In their nation-specific chapter, the authors discuss challenges and opportunities for cultivating an entrepreneurship ecosystem in Kazakhstan's higher education sector.

One issue of building an entrepreneurial university that is rarely addressed is its embeddedness in a certain socio-cultural and political environment. With extensive institution building experience, Dennis de Tray (chapter 7) discusses the phenomenon of 'institutional middle-income trap' or 'institutional reform trap' whereby the development of a world-class university in middle-income developing countries has a good start but then stagnates due to cultural and other barriers. The author reflects on an array of factors that influence the discussed institutional trap and proposes ways and measures to overcome it. Shared vision, risk tolerance, balancing a strong system of autonomy and accountability, reduced dependence on the state are among them.

In order for the entrepreneurial university to be a source of intellectual and social capital development – a point persuasively made by Marat Ibatov, Valeriy Biryukov, Gulnar Zhaxybayeva and Gulnaz Mussina (chapter 6) – it is necessary to form an innovative environment and entrepreneurial culture in the organization. The authors' insight echoes with Kirby's statement that "a culture of enterprise is required that both encourages and enables academics and students to commercialise their intellectual property and inventions. Universities need to recognize that entrepreneurial behaviour should pervade the whole organisation and be recognised as an integral part of their missions" (Kirby, 2006, p.602–603). Considering an entrepreneurial university as a network player, the authors are adamant that academic institutions should not only engage with knowledge "transfer" but also serve as a generating system for social networks with higher levels of social capital that can solve complex intellectual tasks that have a direct impact on the real world.

Collaborative research among academics from different parts of the world is essential for the university to be on a par with other reputed institutions. Aliya Kuzhabekova, Jack Lee and Magzhan Amangazy (chapter 5) make the point that a flagship university needs to link its faculty to international research networks in order to engage with global knowledge production system. In the context of integrating academia, research and industry, the authors take Nazarbayev University as a case to examine the extent to which international faculty in a non-Western country align their research output to the research priorities determined by the government.

The academic dimension of international collaboration as a prerequisite for university entrepreneurship is comprehensively dealt with by Sholpan Tazabek (chapter 3). She sees the university curriculum as the springboard for international collaboration among academics. As she rightfully points out, while universities should pursue collaboration with industry, they should also seek more engagement with other international universities committed to entrepreneurialism. Discussing cross-national and cross-university collaboration around the curriculum, Sholpan argues that faculty plays a crucial role in international partnerships and hence may have a final say in internationalization of curriculum in the entrepreneurial paradigm.

On a related note, with the advent of globalization and internationalization of higher education, the potential impact of Massive Open Online Courses (MOOCs) on instructional practices of universities and students' learning experiences has emerged as an important pedagogical topic. As discussed by Abay Zhussupbekov (chapter 4), MOOCs offer a wide array of opportunities for experimentation on the part of academic entrepreneurs and university managers, with prospects for international team-based approaches to online course design. Universities may establish start-ups and companies providing MOOCs services to the community on national and regional levels.

To sum up, the chapters presented in these proceedings shed light on global and local nuance of developing academic entrepreneurship. The authors invite the reader to take part in the discussion of eminent challenges and reflect on long-term issues of building an innovative and entrepreneurial university. It is hoped that these proceedings will be valuable to university leaders, faculty, graduate students and other stakeholders who have to interact with higher education institutions. Nation-specific chapters on Kazakhstan could be useful to scholars who research developments of higher education in this region.

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FOSTERING INNOVATION AND ENTREPRENEURSHIP: THE TAU MODEL

Joseph Klafter

Despite being one of the youngest research institutions in Israel, at 60 years old, Tel Aviv University is the biggest, with 30,000 students. Almost half of the student body is at the master's or doctoral level. It is the most comprehensive institution of higher education in Israel, with 9 faculties spanning the humanities, arts and sciences, and 125 schools and departments.

Most of the fields that are taught at Nazarbayev University – such as law, economics, medicine, public policy and engineering – are also strong areas at Tel Aviv University. Our graduates and faculty members play leading roles across Israeli society and beyond. They are Supreme Court Justices, cabinet ministers, political leaders, CEOs of top companies, health system managers, educators, famous film and theater directors and much more.

In terms of rankings, I think the two most significant ones for this occasion are as follows. First, Tel Aviv University was recently ranked as a top 100 World Innovation University, and number 1 in Israel. Second, Tel Aviv University ranks 9th in the world for producing successful start-up founders. We are the only school among the top 10 outside of the United States. In other words, our graduates are leading in the entrepreneurship arena right up there with Stanford and MIT.

Over the past five years, TAU produced 250 founders of startups, each of which attracted an average of $1.7 million in venture capital investments. One of these companies, whose co-founder studied economics and philosophy at Tel Aviv University, was sold for over $1 billion to Google.

Now, Tel Aviv University is not a wealthy private university. We do not throw billions of dollars at our R&D. Rather, we are a public, state-funded, highly regulated institution. Let me give you some figures for other recognized innovation universities: Stanford and Harvard spend $800–900 million on research per year. The University of Michigan, which, like us, is a public university, spends $1.3 billion. By stark contrast, Tel Aviv University spends only $160 million annually on research.

So how do we do it? How do we cultivate a spirit of innovation that translates into patents, viable technologies and businesses? I believe innovation-building requires at least 6 core ingredients, and these can be adapted and replicated across different kinds of organizations.

Attracting & nurturing the best people

First and foremost, for innovation to thrive, you need dynamic, intelligent and ambitious people. Now, a key and persisting obstacle in Israel, Kazakhstan and many other countries around the world, is brain drain. Some our best minds leave for North America and Europe, which poses a grave threat to the sustainability of our ecosystem.

How do we go about addressing this, of stemming the steady outflow? The answer is simple – through sustained efforts to bring back and attract star researchers. At Tel Aviv University, our young faculty recruitment program has brought back Israelis from the best

universities in the world like Harvard, MIT and Oxford, with a special emphasis on young researchers in interdisciplinary and emerging fields. This is a costly enterprise – each new lab can cost millions of dollars – but we give it top priority because we are only as great as our people. We are also competing for the best master's and doctoral students, and the only way to do that is with attractive financial incentives such as generous fellowships and attractive student housing.

Fortunately, Tel Aviv University is located in the city of Tel Aviv, which ranks among the top 5 cities in the world for innovation. It's an exciting city, a hip place to work and study, and a magnet for bright and talented young people.

Freedom & Chutzpah

The second critical ingredient is freedom – freedom to think, to question, to test the boundaries of current knowledge. I do not know whether there is a Kazakh equivalent to "chutzpah," but in Hebrew, this term means the quality of audacity, of not accepting "no" for an answer. Chutzpah and freedom go hand-in-hand. In the context of research innovation, what does having chutzpah, of being audacious, mean? After all, pursuing fresh knowledge is the goal of all academic research.

So I think that the added value of Israel, and especially Tel Aviv University, is our tremendous openness toward daring, even crazy, combinations of ideas; and our readiness to break down the walls that separate between fields and disciplines. To encourage interdisciplinary collaboration, we even physically throw people together in one space – chemists, biologists, engineers, computer scientists – to spark the exchange of ideas and collaborative projects. At our nano-center, for instance, we have 70 groups from two dozen departments working together.

You could even say that Tel Aviv University is one big startup – shoestring funding, lots of enthusiasm, long hours and big, world-changing ideas. I think that at a top institution like Nazarbayev University, this idea could especially resonate.

Bridging academia & industry

So we need the best minds, and we need to set their imagination free. But we need a third critical ingredient too. This is robust academic-industrial relations. We need to facilitate a flow of information between academia, business, government and other spheres. When it comes to collaboration between universities and industry, Israel ranks 7th in the world. Compare this with the United States, which ranks 3rd, and with Kazakhstan, which ranks 85th.

Tel Aviv University has partnered for years with top Israeli and multinational companies such as Teva, Israel Aircraft Industries, Intel, Microsoft and Google. These companies set up labs on our campus, give our students scholarships and internships, recruit our graduates, commission major research projects, and, sometimes, license our technologies for commercial development and startups. Our partner companies keep us focused and up-to-date on industry needs, and we keep them abreast of "The Next Big Thing."

At Nazarbayev University, you know well the importance of combining theory with practice. Universities can create the framework for theoreticians and practitioners to meet, exchange knowledge, and learn from each other for the benefit of society.

Diversity

A fourth important element for fostering entrepreneurship and innovation is diversity, which I will touch on briefly. I think that Kazakhstan is no different than Israel: Many bright and ambitious young people are not entering the knowledge workforce because of a lack of opportunity. At Tel Aviv University, we believe passionately in equality of opportunity, not just because it is moral, but because it is smart. Ensuring that the most talented students are given the opportunity to pursue quality higher education – regardless of their ethnicity, religion or socioeconomic background – is not just a matter of social justice, but of competitive survival.

R&D and training

A fifth condition is what I call "innovating the innovation process". Along with shaping a knowledge hub that connects researchers, industry and the greater community, Tel Aviv University is also in the unique position of being able to step back and study the innovation and entrepreneurship cycle itself. We have an internationally reputed business school that researches and publishes extensively on technology management. In fact, we just received a $50 million private donation a couple of weeks ago to transform the business school into a global force for innovation and venture management.

All of our theoretical and practical knowledge is passed on to our students, and not just in business studies. We recently expanded our courses in innovation and entrepreneurship to include students from engineering, exact sciences, life sciences and the rest of the campus. These days, we are opening a campus-wide entrepreneurship center, a one-stop shop, that will serve everyone – faculty, students, alumni and the public – with courses, mentoring, accelerator funding and business planning. That new center will incorporate existing and new accelerators and incubators in smart transportation, bioengineering, brain studies and more.

International collaboration

Finally, and this is one of the reasons I came to speak with you, academia can and should promote international exchange and cooperation. Huge universal challenges such as pollution, food security and cyber-threats require international exchange and collaboration to be solved. To put this more concretely: If R&D is to have maximum impact, universities must have strong links to other participants in the global innovation chain.

I am pleased to announce that Tel Aviv University has four cooperation agreements in the pipeline with Kazakhstani universities. Moreover, at Tel Aviv University we have outstanding international degree programs that could be of great interest to you here, including MA programs in conflict resolution, trauma studies, security & diplomacy and political communications. These programs are taught entirely in English. Altogether about 1,500 international students from 60 countries attend long and short programs at Tel Aviv University each year, and we would love to see more Kazakhstani students among them.

Encouraging such exchange can also enable us – the universities – to have a dramatic impact on strengthening friendships between countries. I see vast potential in what

Kazakhstan and Israel can do for one another in fields of mutual interest, and I believe that, together, we can drive scientific, technological and economic growth.

To conclude, these six ingredients I described – bright minds, intellectual freedom, academia-industry synergy, diversity, entrepreneurship training, and a global outlook – these are key for staying competitive in the innovation arena, and are not only applicable in the academic setting, but also in the corporate and government spheres.

ENTREPRENEURIAL ECOSYSTEM AT UNIVERSITIES: FORMATION AND DEVELOPMENT

Assylbek Kozhakhmetov, Nina Nikiforova and Sholpan Maralbayeva

This paper examines issues of developing an entrepreneurial ecosystem at higher education institutions in the context of Kazakhstan. Authors consider the entrepreneurial university as a system that has its own infrastructure and is an integral part of the ecosystem as a whole. State and businesses are active participants of entrepreneurial ecosystem's formation process at university. Despite the fact that many studies (Röpke, 1998; Clark, 1998; Etzkowitz & Leydesdorff, 2008) focus on the problems of formation and development of entrepreneurial ecosystem and its infrastructure, there is no universally recognized definition of the term "entrepreneurial ecosystem". In Kazakhstan, the formation of entrepreneurial ecosystem is at its early stage. This paper discusses problems related to the underdeveloped entrepreneurial ecosystem and defines main reasons that hamper the development of entrepreneurial universities as part of the ecosystem.

Introduction

In order to increase university graduates' competitiveness in local and international labour markets, Kazakhstan has begun the process of transformation of traditionally teaching-only universities into entrepreneurial ones and has defined the role of universities as participants of the new economic policy. Entrepreneurial universities are the most important actors of entrepreneurial education that serve as a springboard for preparing people to work in the new environment and centralizing innovation economy of the state. In Kazakhstan's context, the rationale for establishing entrepreneurial universities is defined by the following factors.

- Transition of Kazakhstan's economy to the innovation model of development.
- Increased competition on local and international markets for research and educational services.
- Different requirements of business community for training prospective employees that are able to compete in local and international labour markets.
- Need for the development of entrepreneurial thinking and entrepreneurial spirit among faculty, students and other stakeholders.

Formation and development of entrepreneurial universities is not possible without the creation of an effective entrepreneurial ecosystem that constitutes a basis for successful functioning of entrepreneurial universities and allows faculty members and research staff to be involved in entrepreneurial activity (Röpke, 1998). The quality of such an ecosystem is the key factor for successful transfer of technology. Special Report of Intergovernmental Panel on Climate Change (IPCC) "Methodological and Technical Aspects of Technology Transfer" has defined the term "technology transfer" as a broad set of processes covering the flows of "know-how", experience and equipment for mitigating and adapting to climate change amongst different stakeholders" (IPCC, 2000).

Ecosystem as a concept

The term "ecosystem" started to be used a century ago. Firstly, the term was mentioned in the article by British ecologist, Sir Arthur George Tansley, that was published in the 'Ecology' Journal in 1935. In his article, Tansley notices that a combination of all physical elements forms an environment, where "ecosystems (…) are of the most various kinds and sizes" (1935, p.299). Referring his work to biology, Tansley states that the idea of ecosystem can also be used in many areas and fields (1935, p.304).

The term "business ecosystem" was proposed by James Moore in 1996. Since then, the term has been transformed into an "entrepreneurial ecosystem". Currently, this concept is widely used in academic and business fields. Basically, it is assumed that an entrepreneurial ecosystem as an innovative structure should contain four basic elements: idea, entrepreneurial experience of ecosystem's participants, sources of financing and network that combines these elements into a comprehensive system (Kopeikina, 2008). Another view has been expressed in the Report of the World Economic Forum (2014, p.6) and has identified the entrepreneurial ecosystem "as a system of interrelated pillars that impact the speed and ability with which entrepreneurs can create and scale new ventures in a sustainable way" that is based on the following eight 'pillars'.

1. Accessible markets

2. Human capital/workforce

3. Funding and finance

4. Support system/mentors

5. Government and regulatory framework

6. Education and training

7. Major universities as catalysts

8. Cultural support

This approach has been developed on the basis of surveys on entrepreneurship conducted by several parties. E&Y, OECD and Professor Daniel Isenberg of Babson College, Founder and Executive Director of the BEEP Project (Babson Entrepreneurship Ecosystem Project) were among those parties (World Economic Forum, 2014, p.238). Figure 1 shows the Eisenberg's model that consists of six basic elements of the entrepreneurial ecosystem.
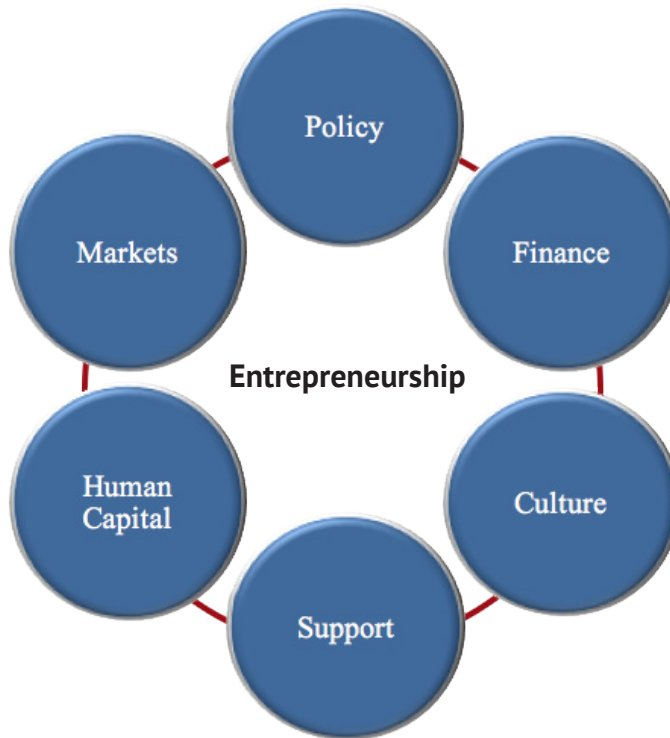
Figure 1: Six Domains of Entrepreneurial Ecosystem

Markets consist of consumers that represent the target audience for business. For better functioning of the market, a company should have qualified staff that makes up the *human capital* and possesses key business competencies. *Policy* is determined by business strategy of a company. *Financing* of entrepreneurship is carried out from a variety of sources, private capital to state grants. Considerable importance of *support* to business from society implies that there is an adequate perception of the business existence as well as institutional and infrastructural support. Entrepreneurial *culture* enables more efficient functioning of the entire ecosystem. According to Eisenberg, without proper education and strong culture, business financing does not lead to entrepreneurship (Eisenberg, 2011).

The current situation in Kazakhstan

Kazakhstan is in the process of forming an entrepreneurial ecosystem that is basically made up of state actors and financial support coming from the state budget (national and local budgets, resources of organizations with state participation) as well as with the support from development institutions that have been established by the State. In order to facilitate coordination of the innovation development process and securing the state support, the government has created the joint stock company "National Agency for Technological Development" and has launched the State Program for support and development of business "Business Roadmap 2020" (2015).

The process of creating entrepreneurial universities is still at its early stage in Kazakhstan. In most cases, higher education institutions (HEIs) in Kazakhstan have been teaching-only institutions. Development of basic approaches to transforming Kazakhstan's higher

education sector into entrepreneurial universities is conducted by many higher education institutions across the country with Nazarbayev University, Alma Management University, Pavlodar State University, Taraz University of Innovations and Humanities, Karaganda State Technical University, Karaganda State Medical University among them.

Despite the fact that certain work towards the transformation of traditionally teaching-only universities into entrepreneurial and towards the formation of academic institutions' ecosystem has been carried out in Kazakhstan, a number of problems hampering the process are identified.

- Many Kazakhstani HEIs do not have essential infrastructure for innovation.
- There is a shortage of qualified managers of technology transfer.
- The legal framework of entrepreneurial universities' management and governance and their structures is underdeveloped.
- There is no shared understanding or common view of the key concepts such as "entrepreneurial education", "entrepreneurial university", and "entrepreneurial ecosystem of university".

To tackle the problems mentioned above, the working group for the development of the Concept "Formation of Entrepreneurial Education in the Republic of Kazakhstan for 2030" has been established. Its main purpose is to define strategic priorities for the formation of the national model of entrepreneurial education that would be directed to obtain knowledge and required competencies in entrepreneurship. The working group has held five meetings that were attended by representatives from 47 universities of Kazakhstan.

It is worth-noting that the innovative economy in Kazakhstan is created by the state which is a typical top down approach. In this context, it is necessary to involve universities in economic processes for the development of sustainable innovative economy. Entrepreneurial universities should become part of the "triple helix" of academic-industry-government relations that will play a major role in the country's economic development (Etzkowitz, 2008).

Discussion

Apart from the two main activities – education and research – universities must participate in economic development of a region through training and supporting entrepreneurs, and through creating new businesses. Only having a self-constructed ecosystem, an entrepreneurial university can deliver the "third mission" (Etzkowitz, 1997). Methods of transfer and commercialization of knowledge should be clear and relevant to universities (Venditti et al., 2013). According to Clark (1998), the main features of an entrepreneurial university are absence of fear of new ideas for development, commercialization and promotion of these ideas into the real world.

In this vein, we propose to define an 'entrepreneurial ecosystem' as a "set of interconnected business organizations (companies, venture capital firms, business angels, banks), institutions (universities, financial bodies, government authorities), and business processes, formally and informally united for mediation and management within the local business environment".

Entrepreneurial ecosystem as a structure is an aggregation of interrelated elements, where, in order to be a system, members of a community should synchronise their policies

and actions. The connection between elements should be definable and visualized in order to assure effective functioning of a university in that system. As Figure 2 shows, the entrepreneurial ecosystem of a university may have the following scheme:

PEOPLE	PROCESSES	INFRASTRUCTU-RE	ENVIRONMENT
Leaders Students Teachers Management	Academic process Student life Entrepreneu-rial activity	Academic divisions Departments IT Technology transfer centers	State Parents Business Society

UNIVERSITY'S INSTITUTIONAL CULTURE
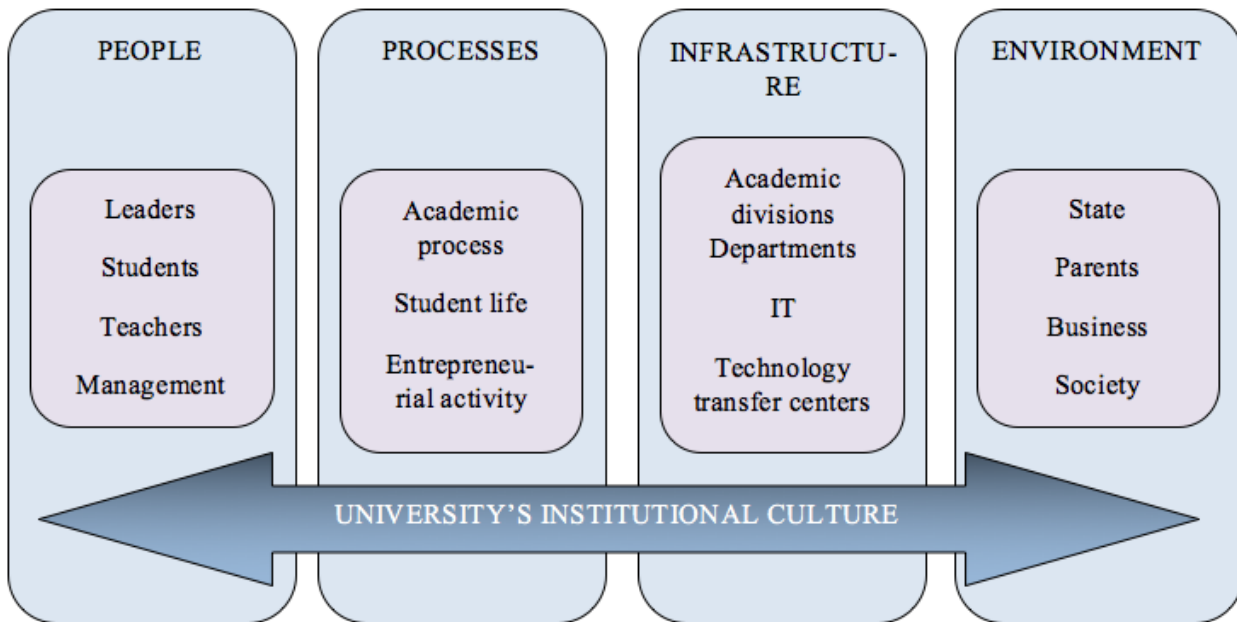
Figure 2: Entrepreneurial University's Ecosystem

People

An entrepreneurial university is a model of private universities that has an inspiring leader who implements initiatives collaboratively with like-minded people. Faculty of an entrepreneurial university must be motivated and encouraged to focus on generating new ideas.

Processes

Along with the traditional business activities of a university, entrepreneurship is a special one. Community service is manifestation of a responsible attitude towards society at large.

Infrastructure

Laboratories and technology transfer centers, consisting of business incubators, business accelerators and co-working spaces, have a special place at entrepreneurial university. Information sphere and related services should be well-developed.

External environment

Surrounding environment of an entrepreneurial university will be complemented by such entities as angel investors, venture companies and endowment funds. As noted in the draft of the USAID Report (2013), there is "underestimation of the role of local institutions" in Kazakhstan.

For more productive university-business relationships, we propose the following diagram which explains interaction of the elements of entrepreneurial university's ecosystem (Figure 3).
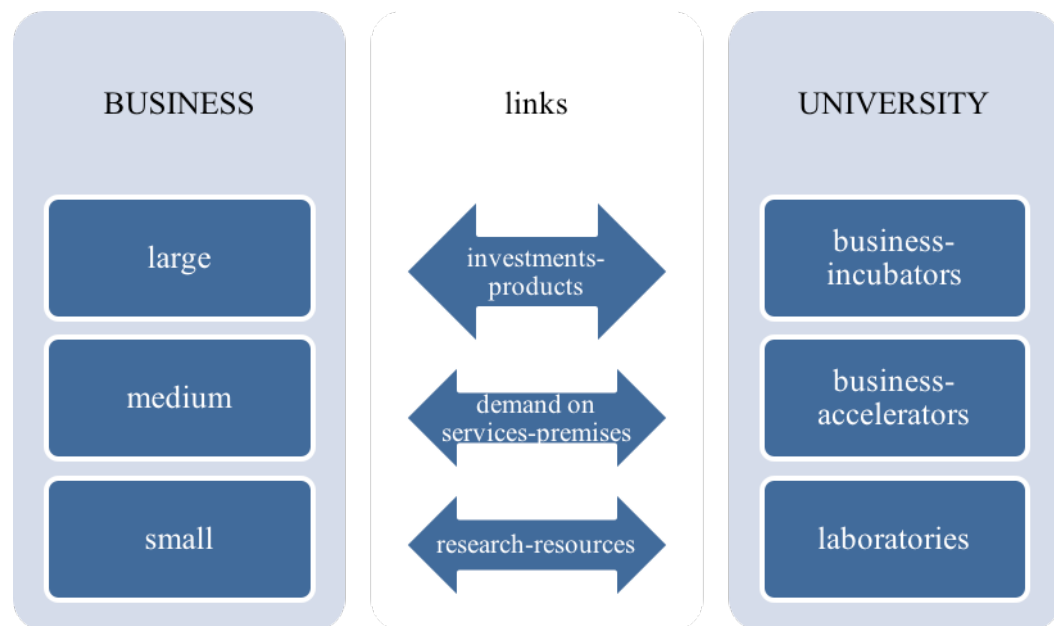
Figure 3: Interactions between a university and business

1. According to the Business Code of the Republic of Kazakhstan (2015) "business incubator is a legal entity created to support small businesses at the stage of their development, by providing premises and equipment; organizational, legal, financial, consulting and information services".

2. The main function of a business accelerator is to repeat the successful business experience in other companies.

3. Laboratory at a university is usually created for conducting research by students under the guidance of instructors.

   Objectives for the creation of structures of an entrepreneurial university allow one to point out the following assumptions.
   - Business-incubators will interact with large businesses as with potential investors, which will fund spin-off companies of university faculty.
   - Business-accelerators can provide a space for entrepreneurs at the initial stage of their business operations.
   - Students, as members of universities' research laboratories, serve as research resources for small businesses.

Institutional culture

A special institutional culture must be created at an entrepreneurial university and its main purpose will be the formation of a positive attitude of society towards entrepreneurship. Institutional culture of an entrepreneurial university should be an integral part of business cultures of a region and a country. It can serve as a basis for the ecosystem on which all the other elements are based. We believe the following elements of institutional culture are essential for developing an entrepreneurial university.

- *Responsibility* of entrepreneurs for decisions and actions concerning their lives and financial condition (as they have a mature *attitude to risk taking).*
- *Mutual trust* between people and a state (as it creates norms to make a more comfortable environment). Institutional trust would be an important indicator of entrepreneurship development.
- *Attitude to success or failure.* An entrepreneur is often a person who comes to success through series of failures and setbacks. As mentioned by Korkhunen and Olimpiyeva (2012) in their study on the role of individual models of behaviour that affect activity efficaciousness of innovative, high-technology companies, "failures are a natural part of career and life."

Institutional culture of an entrepreneurial university is expected to be open for changes. Entrepreneurial culture can be developed, if the university has its own special institutional culture. Such culture encourages all members of a community to develop entrepreneurial skills within all the structural elements and subdivisions of a university.

Conclusion

In order to develop an entrepreneurial ecosystem, universities must create a set of entities such as business incubators and business accelerators that could be managed by both faculty and students. According to Clark (1998), a strengthened steering core, as one of five elements of an entrepreneurial university's environment should be necessarily open and ready for changes. An entrepreneurial ecosystem of a university cannot be established and effectively function without a certain degree of readiness. The following points of action could be relevant to the higher education sector's goal to develop entrepreneurial ecosystem of universities.

- Formation of a pool of strong leaders, managers and owner-entrepreneurs.
- Establishment of close ties with the business community and society.
- Comprehensive transformation of the institutional environment by introducing new structural elements, such as business incubators, start-up project teams into it.
- Integration of academic and research units of a university, based on blurring the edges of traditional disciplines and on creation of start-up projects, which should correspond to the modern methods of knowledge creation.
- Creation of entrepreneurial organizational culture at university.
- Improvement of information structure of a university on a regular basis.

It is worth-noting that these complex and hard tasks of transforming established academic institutions into entrepreneurial ones are not possible to be solved and administered by just one university in the region. It requires combined efforts of many universities as a network. Therefore, there is good reason to establish *Association of Entrepreneurial Universities* as a voluntary entity. This association will be likely to promote mutual cooperation and enable higher education leaders to share local and international best practices. The Association will actively participate in the process of technology transfer and in commercialization of intellectual activity results. Also, it will try to achieve effective partnership with governmental bodies and businesses within the frame of the Triple Helix model.

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INTERNATIONALIZING CURRICULUM FOR INNOVATION: OPPORTUNITIES AND CHALLENGES FOR ENTREPRENEURIAL UNIVERSITIES IN KAZAKHSTAN

Sholpan Tazabek

Introduction

Internationalization of higher education has become an ever-increasing imperative of a modern society. Mainly led by theories of globalization and knowledge economy discourse, internationalization is reshaping the university functioning – even on the margins. This has been emphasized in a large-scale survey conducted by the International Association of Universities. In this survey, 87% of respondents identified internationalization as a central element in the strategic development of their institutions (Egron-Polak & Hudson, 2010). While some scholars explain the importance of internationalization by the challenges of a globalized world (van der Wende, 1997; Altbach & Knight, 2007), it is also true that each university has its own sociocultural context that can shape its perceptions and experiences of internationalization (Yang, 2002).

In the context of entrepreneurial universities, it is widely considered that internationalization reinforces institutional competitiveness and contributes to innovation (Larionova, 2012). Entrepreneurial universities, whose mission is to engage actively in local economy's development, should pay sufficient attention to their internationalization agenda since "it is not possible for a university to be entrepreneurial without being international" (OECD, 2012, p. 14). There are different rationales that seek to explain the importance of internationalization for entrepreneurial universities. One rationale sees internationalization as an action plan for generating new streams of revenue. As universities become "income-generating units" (Deem, 2001, p. 13), increasing number of institutions adhere to principles of teaching and research excellence in order to respond to global and local market demands (Altbach & Knight, 2007).

It is unknown to what extent internationalization is viewed by universities in Kazakhstan as a source for income generation, but the idea of rethinking higher education institutions as entrepreneurial settings is gaining momentum in Kazakhstan. Today, most universities in the country have committed themselves to pursuing internationalization programs. Some do it as part of their institutional agenda while an increasing number of universities are integrating international practices into their academic functioning in post-Bologna policy context. In 2011, as part of its commitment to Bologna policy the government of Kazakhstan created a brand new law "On Science", which provided local universities with new opportunities and resources for internationalizing their research and science endeavors. However, it is important to bear in mind that innovation begins in the classrooms with students and faculty expanding the frontiers of knowledge. Without underestimating the role of academic research in knowledge production, this conceptual paper focuses on why internationalization of teaching and learning is important for people and institutions pursuing entrepreneurialism. Some common concepts of internationalization of curriculum are provided below, and some ideas are addressed on how these concepts can be applicable with teaching and learning practices experienced in Kazakhstani classrooms.

Internationalization of curriculum – defining primary concepts

I believe that conceptualization of internationalization of curriculum should begin with understanding what is meant by the term "internationalization" itself. Although many scholars use a classic definition suggested by Knight (1994; 2004), internationalization of higher education has been recently redefined in a study commissioned by the European Parliament as:

the intentional process of integrating an international, intercultural or global dimension into the purpose, functions and delivery of post-secondary education, in order to enhance the quality of education and research for all students and staff, and to make a meaningful contribution to society (de Wit et al., 2015, p. 281).

This definition connects quality with institutional mission en-route to internationalization, and emphasizes a broader contribution to society. Contribution to society can have different meanings in different nations, but they share the idea that adequate access to cutting-edge materials and resources shall facilitate faculty and students' understanding of self and others. While facilitation can be done through various activities, "at the heart of the development process lies a fundamental reexamination of teaching provision to reflect the challenge of internationalization" (Taylor, 2004, p. 157).

Curricular and pedagogical transformations, or internationalization of curriculum, may be the most significant way of building an academic environment that supports and fosters the development of international and intercultural skills for living and working in a context of global interdependence. Green and Shoenberg state that internationalization of curriculum is the "most important strategy institutions can use to ensure that all students acquire the knowledge, skills, and attitudes they will need as citizens and workers in a rapidly changing and globalized world" (2006, p. iii).

Curriculum in this context encompasses far more than a classroom activity. It is a whole teaching-and-learning experience with all essential constituents embodied in this experience. Hence, internationalization of curriculum can be determined as a "process of incorporating international, intercultural and global dimensions into the content of the curriculum as well as the learning outcomes, assessment tasks, teaching methods and support services of a program of study" (Leask, 2015). An internationalized curriculum incorporates cross-cultural and global elements and seeks to assure the learning outcomes that would help students manage their personal and professional lives. Having obtained these learning outcomes, university graduates will not only navigate their ways more masterfully through different uncertainties, but they will be more willing to contribute to society in which they live. Surrounded by challenging entrepreneurial circumstances of the current era, these students need learning experiences that would educate them to become active players and opportunists of today.

Internationalization of curriculum in entrepreneurial settings – how and why?

Extending the conversation on learning outcomes, it can be proposed that international curriculum in an entrepreneurial setting is the one that integrates business context into teaching and learning practices. Burn and Smuckler (1995) called US academic institutions for curriculum reform that would consider current and future realities of the business world. The scholars suggested that institutional curricula should have "the most profound effect"

on university graduates' "attitudes and perceptions" about the world that these young people would inherit (Burn & Smuckler, 1995, p. 5).

Two decades later, the business world still perceives a certain gap between its realities and "attitudes and perceptions" of new university graduates. In their recent study, Cheng et al. (2016) report mismatch between skills possessed by university graduates and the skills pursued by employers from small and medium-sized enterprises. For example, a characteristic called by the European Commission (2006) as an "entrepreneurial mindset" or "the student's ability to think and respond entrepreneurially" (OECD 2012 p. 8) is highly valued by employers. Many employers believe that despite having a strong theoretical knowledge of business most graduates have little understanding of entrepreneurial and business context (O'Brien & Hart, 1999; Woods & Dennis, 2009). That is, there is an articulation by employers that university graduates are not fully aware about how their knowledge should and can be applied to the challenges of a real world. Then the question is what shall these young people do in order to engage more comprehensively with an ever-changing business environment and a personal life that is full of uncertainties and complexities? The most common response that comes from the scholarly literature is a reference to the Triple Helix model that considers increase in university-government-industry relations (Etzkowitz & Leydesdorff, 2000).

While it is true that universities should pursue extensive collaboration with industry representatives, it is also true that institutions should seek more engagement with other international universities committed to the ethos of entrepreneurialism. These partnerships shall foster faculty collaboration, since it is they who design, teach and assess university curriculum. Without having faculty members fully engaged in this process, it is difficult to expect substantive changes to curricula and quality improvements in learning outcomes. Therefore, it is significant for faculty to have access to teaching and learning opportunities in the international competitive environment. With such experience, they will be more eager to develop the cutting-edge ideas for tailoring curriculum in entrepreneurial era – the one that fosters students to communicate, solve problems, take risks and show leadership in various challenging contexts.

Current trends and emerging needs for Kazakhstan

The past decade has been full of reforms in the higher education sector. Major transformations, which occurred in a Bologna and post-Bologna policy context, have reflected in that most universities in the country have started paying special attention to internationalization. What Kazakhstani institutions mean by internationalization of higher education varies as different institutions look to different higher education traditions and trajectories shaping policy in practice with "multiple influences of Russian, EU, and other international policies" (Silova, 2011, p. 12).

Although Kazakhstani government declares that the country's higher education policy is adherent of the principles of Bologna Accords, the process of internationalization started in Kazakhstan earlier than the Bologna discourse did. It might have started even before initial theories of globalization have begun to emerge in the country. Kazakhstan's population has long since been placed in the center of ethnic diversity. That is, it might be fair enough to state that the issues of equity, multiculturalism, and the acceptance of others have always existed in the nation, which inherited diverse ethnic populations during the era of

Soviet forced settlements. It is that with the new global economy agenda, characteristics of internationalization have started to gain new meaning. Pushed by the government, the universities have been put in a race for competitiveness, and the challenge might get even tougher in the context of a growing university autonomy discourse. Once become self-dependent, universities in Kazakhstan will have to compete harder for funding and excellence. The question is if this race will foster the learning process of those who will take the lead in creating new jobs for the emerging economy of Kazakhstan.

In a survey on perceptions of internationalization processes in universities of Kazakhstan, 67% of respondents viewed internationalization of curriculum as a priority in future reforms (Maudarbekova & Kashkinbayeva, 2013). Consequently, there is a growing need for enhancing the quality of existing curricula, as these perceptions refer to the lack of academic freedom and the excessive amount of state regulation in curriculum design. Apparently, these do not always give universities opportunity to tailor programs that will meet fast-changing needs of students and external stakeholders, like industries and employers.

Another challenge that needs to be addressed is the closed nature of the companies in Kazakhstan (International Business Publications, 2013). The lack of transparent and trustful relations with industry might cause obstacles in creating effective partnerships with different companies. Informal inquiry suggests that this remains as a major challenge for business faculty in Kazakhstan to develop teaching case studies that would help them introduce students to realities of existing entrepreneurial environment in the country, not to mention other opportunities like improvement of the students' career perspectives.

Implications for future research

Internationalization of curriculum occupies the central place in the overall university functioning. It involves many stakeholders whose contribution of time, efforts and sufficient attention is necessary for this process to be successful. Faculty members lie in the heart of these transformations, and they should possess perspectives and skills that would encourage the innovation to start in classrooms. Therefore, more thorough understanding of how curriculum internationalization is perceived by them is necessary before Kazakhstani institutions commit themselves to any further reforms in this area.

It will be useful to explore how faculty are supported in their teaching endeavors at universities. Academics are the ones who deliver institutional mission in the classrooms. They can be truly considered as the architects of curriculum that either will result in the shortage of knowledge and competences in university graduates, or will engender young people to become global academics, global citizens, and global professionals competent enough to face all sorts of uncertainties. Other implications for future research exist as well, but faculty experiences in curricular transformations require detailed research in order to make further improvements in the status quo of higher education curriculum.

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MOOCS AND THEIR IMPLICATIONS FOR TRADITIONAL HIGHER EDUCATION INSTITUTIONS

Abay Zhussupbekov

This paper discusses MOOCs as a trend in higher education[1]. It starts with a brief discussion of the history and role of MOOCs in changing the future of education. It then focuses on implications of online open courses on the traditional system of education in higher educational settings. The paper highlights a high student dropout rate on MOOCs, MOOCs' impact on new instructional practice and their role in student's independent learning with the tutor's little guidance. The paper concludes with providing a critical analysis of the question if MOOCs could supersede traditional classrooms of higher education institutions.

Introduction

A rapid change in technologies has altered the education paradigm as web-based instruction started to play a major role in the teaching-and-learning process. Enhanced technologies lead learners to participate in massive open online courses (MOOCs) through online educational platforms without attending traditional face-to-face classrooms. This leads university faculty to reconsider their roles and teaching-and-learning practices (Bell, 2010). Learning technologies have caused a dramatic increase of open online courses for diverse audiences as provided by different universities. These courses attract numerous people from different geographical locations (Tschofen and Mackness, 2012) to participate in collaborative learning in the online platforms by sharing ideas, expertise, distributing knowledge and obtaining new knowledge within the connected educational environment. Moreover, the courses are free or may require just a small amount of money for a certificate of accomplishment or credits. Consequently, there have been concerns that MOOC-based education may replace traditional classrooms and that universities may cease to exist (Brooks, 2012). I believe that despite the fact that these online courses provide learners with free online open courses, they may not substitute higher education settings since MOOCs have not answered some important questions such as high dropouts of students and the role of teacher's guidance in online education. This short paper will focus on the role of MOOCs in the current higher education sector by critically analyzing the question whether MOOCs supersede traditional universities or not (Zhussupbekov, 2015).

What is a MOOC?

Currently, learning and teaching have witnessed some changes from formal education to informal education due to the advancements in technologies. This might be explained by a wide usage of the Internet (Siemens and Weller, 2011). As a result, people can read, send and share information by breaking geographical boundaries between them. However, some technical skills and proficient language knowledge are required in order to participate in these online courses because they can share ideas in a large-scale learning environment (Bell, 2010). It is worth-noting that the first online course was offered by Siemens and Downes in 2008 (Toven-Lindsey, Rhoads and Lozano, 2015) and found continuation in 2012 when prestigious universities in the US (Longstaff, 2014) provided courses for free without any formal requirements which are usually needed when applicants enter traditional *bricks and*

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1 This paper is an extended version of the author's original essay submitted to the University of Southampton, UK as part of the master's degree program.

mortar institutions (Clarke, 2013). As a result, some universities have started to provide courses for free or for a little fee. Therefore, the number of students who participate in these courses has raised and the courses have become massively open for everyone who wants to study at internationally reputed universities. This resulted in suggesting the term MOOC (massive open online course) by Dave Cormier and Bryan Alexander (deWaard, Abajian, Gallagher, Hogue, Keskin, Koutropoulos and Rodriguez, 2011).

In order to develop a clearer understanding of the acronym 'MOOC', several scholars tried to explain the notion by focusing on the words *massive, open, online* and *course*. Clarke (2013) suggests that it is an online course that does not have entry requirements for a huge number of people of different ages and does not set any restriction for people who do not hold degree certificates or diplomas. McAuley, Stewart, Siemens and Cormier (2010) explain the phenomenon of MOOCs as an engagement of diverse students towards achieving a common learning goal by self-organizing their participation. It does not require admission process to register for the course. However, participants who do not hold some official degrees may not contribute to discussion or peer-evaluation. This creates a gap between degree holders and people who do not have any academic degrees. Cormier and Gillis (2010) assert that the MOOC is a platform where participants are involved in the learning process by sharing course information among themselves via connection and collaboration. Furthermore, Abeer and Miri (2014) state that the MOOCs provide meaningful learning for participants from diverse cultures and nationalities as they take part in different activities such as sharing knowledge in online discussions and peer assessment. Therefore, the MOOCs are online courses that offer an opportunity for people to obtain knowledge which is distributed online and to participate in discussions where they share course materials.

Yuan and Powell (2013) point out that MOOCs provide people with free higher education who are interested in flexible, available and inexpensive education which might be completed in a short period. Moreover, as proponents of MOOCs claim, these courses may offer free high-quality education (Abeer and Miri, 2014). Friedman (2013) views the future with online courses giving an opportunity for everyone who wants to take credits and obtain a college degree from reputed universities, being taught online by internationally recognized professors for a small amount of fee. Therefore, the physical location of the students becomes less important (Toven-Lindsey et al., 2015). This may make changes in the paradigm of people about campus life and perspectives of higher education (Longstaff, 2014). Despite the fact that MOOCs have been seen as a revolution in higher education, these courses may put the traditional system of higher education under the risk (Longstaff, 2014) and may disrupt the current models of higher education (Yuan and Powell, 2013). Moreover, Yuan and Powell (2013) point out that if MOOCs provide full degree courses and official qualifications for participants, this may influence student's enrolment rate at universities and force the universities to rethink their pedagogical processes by applying different creative and innovative teaching and learning practices and reorganizing business models (Gupta and Sambyal, 2013).

Toven-Lindsey et al. (2015) claim that education that is provided by traditional universities may not meet requirements on the labor market and may not equip students with appropriate skills. Consequently, the MOOCs provide an opportunity for learners to choose online courses whichever and whenever they want to complete. Additionally, Siemens (2005) asserts that it has become vital when learners distinguish information which is important or unimportant to them because they do not spend time for information which is not necessary. As a

result, learners become independent when they manage their own learning by choosing a particular online course among numerous opportunities. They also make social connections with people. Kop (2011) suggests that course participants become responsible for the activities such as providing information, managing time, and organizing learning goals with the help of the MOOCs because these activities were under traditional universities' control. It is believed that if the number of participants increases in online courses year by year, this may disrupt some modules that traditional universities offer. Subsequently, the MOOCs may replace some traditional courses or even traditional institutions themselves. However, this proposition has not been proved yet, and students still need some aspects of the traditional universities that cannot be replaced by the MOOCs.

Can MOOCs supersede traditional classrooms at higher education institutions?

I believe that there are several factors of why traditional universities cannot be substituted by MOOCs. The first one is participants' motivation. The participants are driven by intrinsic or extrinsic motivation to take courses. Research by Littlejohn et al. (2015) concludes that people who are interested and eager to gain new knowledge were persons who were intrinsically motivated whereas some participants stated that they were taking the courses with the purpose of receiving a certificate of completion. In the latter case, external factors have influenced the participants' decisions. This might decrease the seriousness of the participants' intensions to complete the online courses that might result in high dropout rates. Therefore, these courses might be suggested as courses for people who want to improve their skills and gain new knowledge. In another relevant study, Fini (2009) found that the majority of people who participated in online courses were learners aged 28 and 69. This category of people would typically hold college degrees. They value online courses as they may prepare them for future career development (Siemens and Weller, 2011). Moreover, Siemens and Weller (2011) claim that informal learners who did not expect to obtain certificates had a lack of motivation and so were due to drop out. Also, if participants do not have English language competency and do not have sufficient ICT skills, they may lose their motivation to study on MOOCs and this may impede active engagement of the learners in the online courses (Kop, 2011).

The second factor of MOOCs' incapacity to replace a traditional classroom is the lack of quality pedagogy in online courses. Since teaching happens online, it requires new teaching approaches and methods which are tailored to teach and assess people online at the same time. For instance, Stacey (2014) states that lecture-based teaching is mastered for many years in traditional universities that might not be appropriate in online courses since participants might become bored by watching online lecture videos and this might provoke them to drop out. As Kay, Reimann, Diebold and Kummerfeld (2013) maintain, teachers have to design and organize their courses so that participants can actively engage in online learning. Experienced teachers of *bricks and mortar institutions* may not transfer their teaching experience from traditional universities to online courses (Kay et al., 2013) because it requires different set of skills, particularly technical skills. Consequently, the development of online courses requires faculty members who have good technical skills in order to design interesting online courses where traditional formative assessment and face-to-face tutoring are challenged by online teaching platforms.

The third reason why online learning platforms cannot supersede traditional universities is the tutors' insufficient engagement with course participants (Kop and Hill, 2008). It is believed that tutors may provide a student with formative feedback and have a personal approach to every student. For example, some researchers found that learners seek guidance from the instructors or advisors because they feel lost (Clarà & Barberà, 2013). Kop's (2011) research concludes that some MOOCs participants need more coordination and direction towards the completion of assignments. As more people engage with online courses, it becomes more difficult to manage them within the courses and provide them with formative feedback. Consequently, online learners may become passive receivers of information since they may barely contribute to the learning process. If online students have some training experience, it may help them to complete successfully an online course (Morris et al., 2005).

Conclusion

This paper has discussed the role of MOOCs in mainstream educational settings. It has attempted to provide an answer to the question of why MOOCs cannot replace traditional universities. Although MOOCs provide an online platform to gain knowledge for free or for a small fee, they cannot replace traditional institutions because they provide students with constructive face-to-face guidance on the part of faculty. People with established professional and academic interests may be strongly motivated to take and complete MOOCs for the sake of their continuing professional development. Beginning learners or novice students without their initial undergraduate degrees or diplomas, may need a closer face-to-face guidance and feedback for their future career development. Despite the increasing trend of designing a great variety of MOOCs in different subjects and fields, traditional face-to-face classrooms and universities are here to stay.

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LINKING RESEARCH TO KAZAKHSTAN'S STRATEGIC PRIORITIES: THE CASE OF INTERNATIONAL FACULTY AT NAZARBAYEV UNIVERSITY

Aliya Kuzhabekova, Jack Lee and Magzhan Amangazy

Recently, the number of research universities seeking to achieve world-class status has been increased by an additional one from Central Asia, Nazarbayev University (NU). The university seeks to achieve high quality research by its faculty and researchers. In particular, the role of international faculty is highlighted in an agenda to build research capacity and in a subsequent contribution to the country's development. Several studies from the US on faculty productivity showed that international faculty produce greater output than their local counterparts do. However, it remains unclear whether research conducted by international faculty when working in non-Western contexts is relevant to the national research priorities of the host countries.

The purpose of this study is to examine the extent to which international faculty in a non-Western country align their research output to the research priorities determined by the government. To address the research purpose, we used content analysis method. The study relied on secondary publication data from abstracts of articles published by NU international faculty in peer-reviewed journals included in the Thompson Reuters' Web of Science. The results of the content analysis revealed that international faculty from NU largely produce research relevant to the country's needs. This is particularly typical of researchers in sciences whose research generally aligned to the country's research priorities; meanwhile, researchers in social sciences and humanities produce a greater number of irrelevant articles in their total number of publications. Several possible explanations for the revealed results were discussed. This study attempts to provide a comprehensive picture on the role of NU and its international faculty in pursuing the country's needs.

Introduction

Given the world-wide acknowledgement that an important requirement for economic growth in the context of the global knowledge-driven economy is having a well-developed national research and innovation systems (Altbach, 2013; Castells, 2009), strengthening existing and creating new research universities has become an important task on the economic development agendas of many governments, especially in middle-income economies. Most countries with limited public resources focus their efforts on developing a limited number of globally competitive universities (Salmi, 2009). These universities are referred to as "world-class" or "flagship" in the existing literature. The world-class universities "have highly ranked research output, a culture of excellence, great facilities and a brand name which transcends national borders" (Douglass, 2014, p.1); while the flagship universities are also "research-intensive or in the process of becoming so" (Douglass, 2014, p.2), but, in contrast with the world class universities, are expected to serve the public within their local, national, and regional boundaries (Douglass, 2014). Given the high cost of establishing and maintaining world-class universities, many governments are now following the advice of international experts on higher education and are re-orienting their efforts towards promoting flagships.

One of the key defining characteristics of flagship universities, according to Douglass (2014), is internationalization. Flagships are frequently built following the prototype of top research universities, which have a high degree of internationalization as one of the defining characteristics (Horta, 2009). Jacob and Meek (2014) linked the growing extent of internationalization of research universities to the emergence of the global knowledge production system, whereby knowledge production and transfer occur at the global vs. local scale via world-wide scholarly networks. To be included in the global knowledge production system, a flagship university needs to link its faculty to international research networks by either inviting foreign faculty from abroad or by sending its faculty to other countries (Douglas, 2014).

In many research universities in non-Western world, the proportion of international faculty is increasing (Wildavski, 2012). The governments of these countries are willing to spend lots of money to attract foreign faculty out of the belief that international faculty will enhance local research capacity and assist in knowledge and technology transfer (De Witt, 2009; Stromquist, 2007). Several studies from the US showed that foreign born faculty bring a considerable contribution to domestic science (Black & Stephan, 2010; Corley & Sabharwal, 2007; Kerr, 2008; Stephan & Levin, 2001; Stephan & Levin, 2003) and produce greater output than local researchers (Hunt, 2009; Mamiseishvili & Rosser, 2010). However, it remains unclear how international faculty actually contribute to research capacity building in non-Western countries.

One of the gaps in the existing knowledge is a lack of clarity on whether research conducted by international faculty when working in non-Western contexts is relevant to the national research priorities of the host countries. The purpose of this study is to examine the extent to which international faculty in a non-Western country align their research output to the research priorities determined by the government. More specifically, the study analyzes the data from Nazarbayev University (NU) in post-Soviet Kazakhstan, which was established in 2010 to address the problem of low local research capacity, which emerged as a result of out-migration of intellectual cadre from the country after the dissolution of the U.S.S.R.. The NU hires an impressive number of foreign faculty and receives ample funding and relative autonomy from the government to implement the explicit public-service-oriented mission to "be a model for higher education reform and modern research in Kazakhstan" (Nazarbayev University, 2013).

Methods

The study was organized around the following research question:

To what extent do foreign faculty employed at NU pursue areas of research which have been defined as strategic by the government of Kazakhstan?

To answer the research question content analysis method was used. Content analysis is a technique used to make inferences about the content of recorded text (Miller & Whicker, 1999, p. 6). The dataset for analysis consisted of abstracts of articles published by NU international faculty in peer-reviewed journals included in the Thompson Reuters' Web of Science during the period from the date of establishment of the NU in 2010 till July 30th 2016 when the data was harvested.

In the analysis, the challenging task was to determine who of the researchers in the dataset were locals and foreign. We identified all Kazakh and Russian family name holders in the dataset as local faculty since we assumed that these two dominant ethnicities of the country should be representatives of the local faculty in the university. We then compared the sub-set with the names in the university telephone directory, as well as background information on the Internet. However, this approach did not ensure inclusion of ethnic minorities, such as Koreans or Germans. Because representatives of the ethnicities are very few at the NU, we decided to ignore the issue and to treat the minorities as international faculty. Thus, final dataset included 171 abstracts published by the subset of foreign faculty.

Research priority areas were extracted from the two annually published national reports on research, produced by the Ministry of Education and Science (MES) in 2014 and 2015. These reports describe general characteristics of Kazakhstani research, identify research priorities, and provide detailed analysis for research capacity of the country for the respective years. Table 1 summarizes five large research priority areas and sub-priorities extracted from the text of these reports.

Content analysis was implemented on the text of the abstracts of the articles produced by foreign-born faculty. We set the research priorities identified by the government as themes (nodes) in NVIVO. We then coded each abstract from NU foreign faculty to one of the themes. Finally, we calculated the frequency of occurrence of particular research priority areas in the dataset.

Table 1 Government Research Priority Areas

	Rational use of natural resources, processing of raw materials and products	Energy and machinery	Information and telecommunication technologies	Life science	Intellectual potential of the country
Priorities					
Sub-Priorities	Minerals	Nuclear energy	Telecommunication technologies	Pharmacy	Natural sciences research in a-e
	Oil and gas	Heat and electric energy	Creating geographic information systems	Anti-aging	a) Biology (microbiology and virology, genetics, physiology, botany and bio ecology etc.)
	Exploration and geology	Laser and plasma technologies	Information and telecommunication technologies in economy, management systems, defense and security, and education.	Biological research	b) Chemistry (organic chemistry and polymers, inorganic chemicals and fertilizers, petrochemicals and catalysis, electrochemistry and corrosion, etc.)

Sub-Priorities	Processing raw materials		Image processing theory	Biotechnology	c) Physics (semiconductor physics, nuclear physics, astrophysics, nanotechnology and new materials, theoretical physics, technical physics, etc.)
	Water resources	Hydrogen energy	Intelligent information technology	Ecology	d) Mathematics (differential equations, probability theory and mathematical statistics, computational mathematics, mechanics, etc.)
	Research in mining	Nanotechnology in the energy sector	Intelligent robotic systems	Industrial biotechnology	e) Geology and geography
Sub-Priorities	Creating new materials, including construction and engineering materials and technologies	Renewable energy sources (wind energy, hydro- and biofuels and photovoltaics)	High Performance computing technologies	Medical research (surgery, oncology and radiology, pulmonology, cardiology, immunology etc.)	Research in social science and humanities (history and archeology, philosophy, education, economics, law, literature and art, and others)
	Research in metallurgy (ferrous and nonferrous metallurgy, refinement processes, electrolytic, metal production by electrolysis, precious, rare and rare-earth metals)	Power machines, rocket and space technology, agricultural machinery, transport	Methods and technologies for information security and data protection	Agricultural science (animal husbandry and veterinary science, agriculture, genetic engineering in agriculture industry etc.)	Astrophysics (deep physics, numerical simulation, nuclear astrophysics)
	Environmental protection	Impact of the energy sector on the environment			
	Seismology				

Results

Our analysis showed that out of the 171 articles analyzed, 149 (87%) were relevant to government's research priorities. Table 2 illustrates distribution of relevant articles by large research priority areas (as defined by the government). Slightly more than half of the publications (51.01%) were found to be relevant to the broadly defined *intellectual potential of the country* priority area comprised of natural science, and humanities and social sciences. Within this large priority area as well as among remaining areas, the largest number of publications was published in natural sciences (43.62%). The next priority area to which NU foreign faculty's publications were relevant is life sciences, followed by information

and telecommunication technologies (13.42%). A much smaller number of articles was published in humanities and social sciences (7.38%).

One of the potential explanations is that three out of four schools associated with social sciences at NU are professional/graduate schools, and they employ less faculty than the School of Engineering and the School of Science and Technology. Hence, numerically, there are more faculty members specializing in natural sciences at NU than the faculty specializing in social sciences and humanities. In addition to that, much of the NU research in the early years was produced by specialized research centers – Center for Life Sciences, Center for Energy Research, Interdisciplinary Instrumental Center, and Nazarbayev University Research and Innovation System. These centers have received ample funding from the government and are staffed by full-time research staff and technicians, and control access to equipment and laboratories. Some faculty in natural sciences are affiliated with the research centers and might have had a higher productivity due to the support and funding provided by the centers.

Table 2 Distribution of Relevant Articles by Large Research Priority Areas

Priorities	n	%
Intellectual potential of the country	76	51.01
Natural science	65	43.62
Humanities and social science	11	7.38
Life science	33	22.15
Information and telecommunication technologies	20	13.42
Rational use of natural resources, processing of raw materials and products	11	7.38
Energy and machinery	9	6.04
Total	149	100

We categorized irrelevant articles in two categories: natural science, and humanities and social science (Table 3). The results of the content analysis revealed that 22 articles (13%) were not relevant to any of the five large research priorities determined by the government. Moreover, it is important to note that analogously to the *relevant articles*, many (64%) of the irrelevant articles were from *humanities and social sciences*. Examples of such articles included a completely irrelevant study of Zeno Cosini's philosophy of humor or the indirectly relevant study of regulation of financial services in the Republic of China.

Several possible explanations could be drawn to explain why some publications were not relevant as for research priorities. First, irrelevant publication(s) could have been in progress before foreign faculty and/or researcher(s) came to NU and published afterward on the behalf of NU. Second, some articles might have been converted from Ph.D. dissertation; thus, it is reasonable to account that some publications were not relevant to the country's research priorities. Third, international faculty members might have been involved in the projects that were not relevant to the country's research priorities because they were run and initiated by their colleagues outside Kazakhstan. The factors affected relevance of research in social sciences and humanities more because, unlike research in natural sciences and life sciences, research in these fields might be of less universal applicability. In addition to

that, government might have favored research in natural sciences and life sciences more in distribution of funding, which affected the choice of research topics. Social scientists and scholars in humanities did not have to meet government expectations in terms of research priorities if they were not provided with funding.

Table 3 Distribution of Irrelevant Articles

Priorities	n	%
Humanities and social science	14	63.64
Natural sciences	8	36.36
Total	22	100

Conclusion

The study revealed an important finding: international faculty members employed in a flagship university in Kazakhstan largely produce research relevant to the country's needs. This is particularly typical of researchers in sciences. Meanwhile, researchers in social sciences and humanities produce not only a smaller number of priorities-relevant articles compared with other fields, but also produce a greater number of irrelevant articles in their total number of publications. The difference between the disciplines is largely related to the nature of knowledge generated in the fields (more universally applicable or more contextually determined), as well as government's funding priorities.

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ENTREPRENEURIAL UNIVERSITIES IN THE FORMATION OF NATIONAL INTELLECTUAL AND SOCIAL CAPITAL

Marat Ibatov, Valeriy Biryukov, Gulnar Zhaxybayeva and Gulnaz Mussina

This paper discusses challenges of developing entrepreneurial universities and their crucial role in building intellectual capital of the nation. Entrepreneurial universities position themselves not only as academic institutions of knowledge "transfer" but also as a generating system for social networks with higher levels of national and social capital that can solve complex intellectual tasks that have a direct impact on the real world. This feature can be implemented and continued through giving university graduates an opportunity to learn to solve applied research problems in their corresponding fields of study. From this perspective, the entrepreneurial university should sustain practice of formation of different research schools, uniting graduates not only by a certain body of knowledge but by research and development of schools outside the university as a social network. Entrepreneurial universities may become an important element of industrial clusters, overcoming the lack of financial resources and promoting the development of regions in which they operate.

Increasing competition in the education market and reduction of direct financing from the state budget complicate adaptation of higher education institutions to new conditions. Best practice of the world's leading universities suggests that entrepreneurial activity provides an adequate response to changes in the environment and therefore could be considered as the key to success of university development. Higher education leaders who want to set a culture of entrepreneurialism on their campuses should be able to start from small and cut through entrenched patterns of institutional practices and status quo. As Davies (2001, p. 29) states,

"This relates to the nature and rate of expansion of entrepreneurial activity (continuing education, R and D, technology transfer, consultancy, etc.), and a spectrum may be observed from situations where this type of activity is really quite marginal to the institution, and has not permeated the culture to any significant degree, to situations where it is very extensive and part of the lifestyle."

Entrepreneurship contributes to satisfaction of both society and market needs. In this regard, definition of the essence of the entrepreneurial university as a form of integration of education, science and business is especially important in the framework of the national innovation system. In order to achieve international competitiveness, local academic institutions of higher learning should carefully analyze and effectively use international practice but at the same time to develop and apply their own approach in the local context.

Shared understanding among stakeholders plays an important role in tackling the gap between research and business cultures. Scholars' language is not always comprehensible for practitioners. At the same time, researchers do not always understand the needs of businesses and markets. Advanced companies are taking the form of industrial clusters that understand that research and innovation is an important factor for the development of business. Basically, they perform the role of network intermediaries and are able to speak the language of both business and science. At present, these companies fill the niche of entrepreneurial universities.

Education has always been one of the pillars of human capital development. In Kazakhstan's case, the State Program of Education Development for 2011–2020 indicates that "investments in human capital are of vital importance in the development of technically progressive, productive labor force, which can adapt to the rapidly changing world. Those economies that invest in development of education, skills and abilities of population will gain success in the future. Education should be regarded as economic investments, but not just as social expenditures" (2010, p. 6). Human capital is the result of a conscious investment of financial resources into education, accumulation of work experience and health (Clark, 1998). When discussing the cost of human capital development, two basic positions are considered. The first position is constituted by tuition fees, interests on educational loans and other direct costs. The second position, according to the theory of opportunity cost, is loss of income that could be caused by spending time and money spent on increasing human capital (Becker, 1964).

Getting an education lays the foundation for professional competences, qualities and abilities. Education is not only an essential element of human capital development but, also, is an important indicator of human development. As powerful mechanisms of social reproduction, academic institutions promote stereotypes and contribute to the stratification of society (Bourdieu & Passeron, 1990). Stratification of society becomes the basis for social differentiation. If people do not get a quality education, it increases major economic and social costs.

In the last two decades, Kazakhstan has removed the state monopoly in the field of higher education. Higher education institutions with different forms of ownership were established: state universities, academic institutions that are run as joint stock companies, private and international higher education institutions. These institutions provide an opportunity for higher education to a large number of graduates of secondary and post-secondary institutions. On the one hand, the development of private higher education opened the possibility of training on a fee basis. On the other hand, drastic reduction of the number of places for university entrants due to the lack of state budget has limited access to higher education for those that are not able to pay for their education.

The concept of entrepreneurial university is significantly important for contemporary higher education institution's transformation. This term refers to a higher education institution that is capable of attracting additional financial resources; or to a university that uses innovative methods of instruction; or to an institution that closely cooperates with industry and demonstrates the development of university-based researchers. The disparity between academia, research and industry complicates operationalization of the concept of "entrepreneurial university" and leads to self-declaration of universities as "entrepreneurial".

It seems appropriate to consider some key elements of entrepreneurial activity at higher education institutions in order to facilitate strategic planning of their activities. Based on the work by Röpke (2000, p.3) and the study by Konstantinov & Filonovich (2007, p.53), we believe that the concept of "entrepreneurial university" means the following:

- university demonstrates entrepreneurial behavior as an organization.
- members of the university – faculty, students, employees – are turning themselves somehow into entrepreneurs.
- interaction of the university with the environment should follow entrepreneurial patterns and lead to organic connection of the university and the region.

In 2013, the Ministry of Education and Science of the Republic of Kazakhstan initiated the inclusion of special courses focused on entrepreneurship in academic programs. This approach implies studies of entrepreneurship with the focus on acquisition of practical skills and development of entrepreneurial orientation. The primary feature of an entrepreneurial university is openness for commercialization and knowledge transfer. University members are willing to take initiatives in commercialization of academic traditions and take risks in respect of a negative impact of entrepreneurship on the quality of education. The entrepreneurial orientation assumes diversification of the university's funding sources. It is believed that a management style of a university should provide flexibility and strategic interaction with the environment. Also, higher education governance and management is an important factor for effective functioning of an entrepreneurial university.

One can argue that in order for a higher education institution to be called an 'entrepreneurial university', that institution must overcome limitations in the following three areas:

- knowledge generation: to constantly work on generating new research, to explore new areas of knowledge and to identify new challenges in the research areas;
- teaching: to develop innovative teaching methods and to integrate learning content with cutting-edge research, latest achievements in science and practice;
- implementation of knowledge into practice using various approaches to the university's regional engagement.

Restrictions in those three areas always involve a deficiency of basic types of resources. More specifically, these are financial, information and human resources. It is not possible to establish an entrepreneurial university without the solution of the resource problem. Therefore, traditional universities are likely to understand that these problems should not be resolved solely on their own but by all the members of their regional environment.

Under the new conditions of austerity measures, universities are expected to reduce government spending and be economical in research and development while engaging with innovation development. Universities are extremely sensitive to the reduction of public expenditures on education – for instance, budget of UK universities has been decreased by 20–25%. According to the studies conducted by the European University Association, reduction of state spending on higher education per student has become a global trend. Development of the process of diversification of funding is one of the key EU priorities (Estermann, 2009). The process of modernization of higher education contributes to the diversification of funding of higher education. Problems with resources could be resolved by changing the internal environment of a university. Particularly, changes of the university's corporate culture as well as changes aimed at decreasing trends for isolation and tackling the "ivory tower" issue could be helpful.

An entrepreneurial university should be a network player in the cluster that can solve problems that go beyond the existing limitations and enhance the competitiveness of the company, industry, region and country. Location has always played an important role in the competition, but in recent years this role has changed dramatically. The concentration of companies in a small area that serve institutions and universities has become an important factor in achieving competitive advantage, especially in the generation of innovations. Examples include Hollywood in entertainment, Silicon Valley in IT, shoe industrial cluster in Lombardy, Italy. Universities have always been a generator of social networks, especially those which have managed to generate successful alumni. Those business schools that

have established solid professional alumni communities for people to support each other in business and management after graduation have turned to be very successful.

Another perspective for the university to become an entrepreneurial institution is to reconsider its institutional philosophy of curriculum design. Through modernization of curriculum content and instructional practices, an entrepreneurial university can play an important role in community engagement. In this regard, such forms of organization as interdisciplinary teams, centers and networks must be used in higher education institutions' academic programs. This model of teaching-and-learning process enables university faculty to conduct joint projects, develop understanding of systems of concepts and study language and mindset of another corporate culture. At this moment, the current organizational structure of universities prevents the implementation of this idea. Universities should enable students to focus on their career orientations right from their first days on campus and not to deprive them of the opportunity to master and read professional languages of education and industry cultures at the same time by developing some key academic programs along with employers, local firms and companies.

Long-established conservative structure of academic departments, faculty's formally fixed functions and responsibilities as well as unequal distribution of funding are the major problems that innovative initiatives face. Current organizational structure of academic departments of many universities fails to meet changes occurring in the university management and falls behind the dynamics of the development of higher education in Kazakhstan. Established practice to abide to centralized state education standards, transition to the system of multi-level education, development of vocational education and training, and other important circumstances should be taking into account when discussing approaches to building entrepreneurial universities.

Another tendency of formation and development of entrepreneurial universities is commercialization of education. Education has become business (Williams, 1995). According to the World Trade Organization, the global education market capacity is 50–60 billion dollars. Higher education institutions of post-Soviet era, especially STEM education, used to enjoy recognition and respect around the world. These days we must recognize that the post-Soviet countries are losing ground in the global market of educational services in a competitive environment.

Kazakhstan has made some steps forward in developing innovative and entrepreneurial universities. For instance, Nazarbayev University is one of the models of integration of education, science and innovation. It is expected to become a center of education and research cluster in Central Asia and the CIS. Today, the University has Nazarbayev University Research and Innovation System that includes Center of Energy Research, International Interdisciplinary Instrumental Centre. Also, Kazakhstan's network of technical universities has a capacity to become a new generation of universities that will combine functions of education, research, and entrepreneurship. It is necessary to consider mechanisms of transformation. For example, in Sweden the process of transition to the entrepreneurial university began with the 1990s. All universities in the country established a system of entrepreneurial education, i.e., entrepreneurs were invited to universities as instructors and faculty members (Johannisson, 2006).

Finally, the transformation of a higher education institution into an entrepreneurial university is not possible if the initiative will only come from the state or other external counterparties. Therefore, it is necessary to form an innovative environment and entrepreneurial culture in the organization. Higher education leaders should encourage academic departments and faculty members to engage with problems and solutions that have practical significance to relevant markets. The task of the university is to support creative initiatives of people who are able to implement innovative projects, creating conditions for the development of new products and technologies, implementation of application solutions used in the economy, in particular companies and enterprises. It will take a major change in the structure and content of curriculum, the essence of which would require the academic community to go beyond the use of didactic and transmission approaches to teaching and learning. We believe that key curriculum innovations of the entrepreneurial university will include trends in communication technology, critical thinking and imagination aimed at solving practical real-word problems, project-based learning and teamwork. In this system, the traditional role of the professor will definitely change. Faculty's teaching activity will be supported by the organizers of the communication industry and technology experts, project leaders.

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THE INSTITUTIONAL MIDDLE-INCOME TRAP

Dennis de Tray

Most students of international development are familiar with the term "middle-income trap," which refers to the penchant for countries to reach middle-income status and then stagnate[1]. In this short note I am proposing a similar and related phenomenon: the "institutional middle-income trap" or "institutional reform trap" whereby institutional development in middle-income developing countries starts out well but then stagnates, or does not reach its goal – which is usually to develop a world class institution. Universities are a particular example of this phenomenon. These observations are based on extensive institution building experience in 10 developing countries, more than half of which are classified as middle-income. They are also initial thoughts on which I plan to build in the future.

One way of the thinking about the middle-income trap is that countries start aggressive reform programs but at some point a fear of losing their national identity by becoming too globalized – i.e. too Western – takes over. At this point a combination of nationalism and vested interests bring institutional reforms to a standstill. This explanation has at its base the cultural nature of development and globalization. It is also a phenomenon found in high income developed countries – as both the Brexit vote and Trump's election and the political turmoil in Europe demonstrate: a fear of globalization and of losing national identities extends well beyond middle-income countries.

Universities are among the most culturally based institutions a country tries to develop. Below I discuss briefly some of the cultural and other barriers to developing world class universities which are, I believe, at the base of the institutional middle-income trap. The last section considers ways of avoiding this trap.

To build a global class university in a non-western culture requires a combination of imported external expertise and local expertise working together to figuring out how to make international good practice work in a non-western context and culture. This can be a difficult relationship to build since at its foundation is a strong sense of shared vision, a lot of trust, and a healthy dose of shared responsibility. The difficulty in developing this relationship is exacerbated by language and cultural differences and by the fact that many of the imported experts often do not have a deep understanding of the country in which they are working, and often do not have the necessary long term perspective.

One area of great challenge in combining Western goals with non-western cultures is that of governance – a university's structure of management and control, which includes its Board of Trustees, its senior management and in most top universities some form of shared governance in which faculty play an important role in the decision making process. In many countries, a university's governance structure also includes the government. This is true at all levels of development as state universities in the US demonstrate.

University Boards of Trustees can be seen by supporting governments as vehicles for controlling a university. This often means that Boards have heavy government presence; while this is reasonable given the investment countries are making in developing a new

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1   For a history of the concept see Gill and Kharas "The Middle-Income trap turns ten," World Bank, August 2015.

university, it can lead to dysfunctional Boards that are reluctant to take on difficult policy or personnel issues and are not interested in any form of "share governance."

Modern universities are in effect collectives in which the members – faculty and researchers - share in governance, but many developed countries are more comfortable with a top-down command and control style of management.

Virtually all great teaching and research universities have some form of shared governance where all stakeholders of a university, especially faculty, participate in the decision making process; but shared governance is a concept that traditional emerging market countries do not always understand and are often uncomfortable with.

To add to the governance/management problem, modern universities tend to rely on delegated authority to offset their reach and complexity – top-down management systems obviously makes this difficult, which exacerbates the conflict between emerging market management styles and the needs of a modern teaching and research university.

In addition to these governance challenges, there is often a disconnect between the workings of a modern teaching and research university and many developing countries' bureaucracy and bureaucratic mindset. Most emerging market universities are heavily dependent on the state for funding which means they are subject to the government's oversight mechanisms.

What this adherence to the government's oversight requirements can mean is that efforts to bring modern systems – HR, procurement, financial management – to a new university do not develop as they need to because new systems would violate the status quo and are not consistent with the oversight authority of the government. In other words, a new university's administrative system has to be consistent with the systems in place at large in the country, making changing them problematic.

Nowhere is this more evident than in the sphere of research and innovation– in the compliance mentality of many governments' oversight, giving money for things for which you cannot specify specific outcomes is a no-no, but research outcomes are by definition unknown. And entrepreneurial activity is inherently risky. This compliance mentality stifles individual initiative, common sense, and risk taking; this mentality is built on a foundation of distrust, which means that it often very difficult to give discretion over budgets to senior researchers or managers. This leads to large inefficiencies, frustration, and micromanagement – not what a world class institution needs to flourish.

On the other side of this ledger, there is often a lack of understanding among faculty over the value for money equation: the fact that a university especially in its developmental stage is using up significant amounts of a country's fiscal resources means it will be under constant pressure to show it is delivering value for money.

Then, there is the obsession with emulating the world's best established universities – What I have come to call the "curse of the League Tables." New universities are under great pressure to distinguish themselves internationally which generally means being on the rankings of one of the global university ranking organizations.

When a developing country sets out to build a global quality university it is seeking to build a university that meets global standards but remains inherently a national university. Emerging market economies do not need clones of Harvard, Princeton, Oxford or Cambridge;

at their stage in development these counties need to be in the business of adapting new knowledge to the specific challenges their country faces rather than creating new knowledge.

A final challenge is the inherent political nature of good universities – great universities have at their foundation a strong commitment to academic freedom, almost a requirement to question/challenge the status quo. This often puts them at loggerheads with the political systems on which they depend for support. Again this is a phenomenon found in high as well as middle-income countries.

These are all challenges that many middle-income (and other) countries face when they launch an effort to develop a world-class university. The following section looks at what countries can do to alleviate these barriers.

What can countries do?

The starting point for avoiding the institutional middle-income trap has to be with the highest levels of leadership in the government – what do they really want and do they understand the consequences of developing a world class university? This is a difficult conversation, but if it does not take place a new university is more than likely to fall victim to the trap.

Institutional culture starts with leadership – so an important step in reducing the risks set out above, is to get the university management group to work as a team – at the core of this effort needs to be developing a sense of shared vision for the university. This shared vision needs to be agreed on with the political enabling environment to avoid future conflicts. When this is in place it is on to building trust and communications within the team, and clarifying roles and responsibilities. Of course this advice is not restricted either to university management or to middle-income countries, but applies generally to good institutional management.

As a part of agreeing on a vision for a university, management needs to redefine the notion of deliverables – What can universities offer the government auditors in lieu of input-based "performance," criteria alternatives that shift the conversation from inputs to outcomes?

How can university management, its Board of Trustees and the government know when the institution is headed in the right direction and when it is not? In other words, rather than hoping to change government systems, how can new universities adapt to those systems without putting the core values and objectives of the university at risk.

Answering this question is made more difficult by the fact that creating a teaching and research university is inherently a long term institution building process, yet the government and other stakeholders have the right to and need for short and medium term milestones against which university management can be held accountable.

These output measures must balance off two competing broad objectives – to create an institution which measures up well against the world's best, and yet delivers on the specific needs of an emerging market economy.

The first goal requires cutting edge research and publications in top international journals; the second a more practical applied approach to research and innovation that aims at applying the world's knowledge to a specific country's needs.

Getting this balance right is made more difficult when a new university has a heavy component of expatriate faculty most of whom will inevitably want to stay mobile which means playing by the league-table rules. But incentive structures can be developed that encourage both cutting edge research and the application of that research to national issues.

Then there is the issue of the need to develop a sensible level of risk tolerance. Emerging market universities need to be engaged in the full spectrum of intellectual development from identifying important problems to research on solutions to development of applications to solve specific problems to patents to establishment of startups to industrial development.

While many aspects of this developmental value chain will be done in partnership with non-university players – governments, industries, financial intermediaries among others, a top emerging market university will be the catalyst that gets the process started and sees that it is completed.

This innovation and entrepreneurship role is inherently risky – emerging market universities must foster an environment of smart risk taking, one that rewards those who have the courage to explore new areas of economic activity. As the track record of Silicon Valley and other centers of innovation attest, innovation success often has at its foundation unsuccessful previous efforts. What great universities do is ensure that the lessons from past failures are captured and serve as the starting point for the next round of projects.

Many of the issues outlined in the previous section have at their core the financial dependence of new universities on the state. It follows that the sooner a new university can reduce its dependence on state financing the sooner it is in at least partial command of its own fate. However, in the politically charged environments of many emerging markets, a new university can never ignore the political environment in which it resides – which is also true for state run universities in the USA. Reducing dependence on the state means building endowments, having appropriate tuition levels, tapping alumnae, and benefiting from innovation and fees for service.

The bottom line is that university managers must constantly distinguish between ends and means – to attain global status, an emerging market university must for the most part adhere to the global rules of the game, that is, the globally set goals. The challenge is to achieve these goals with instruments that are consistent with the countries cultural and bureaucratic settings.

NAZARBAYEV
UNIVERSITY

Nazarbayev University (NU) is a brand-new academic institution located in Astana, the capital of Kazakhstan. The University was founded in 2009 with the personal initiative of President Nursultan Nazarbayev to prepare the next generation of leading researchers and professionals.

To achieve quality education and research, the University is collaborating with the leading universities and institutions in developing its schools and centers among which are University of Cambridge, University of Pennsylvania, University College London, Duke University, University of Wisconsin-Madison, National University of Singapore and University of Pittsburgh.

Currently, there are eight schools at Nazarbayev University:

Graduate School of Business	gsb.nu.edu.kz
Graduate School of Education	gse.nu.edu.kz
Graduate School of Public Policy	gspp.nu.edu.kz
School of Engineering	seng.nu.edu.kz
School of Medicine	nusom.edu.kz
School of Humanities and Social Sciences	shss.nu.edu.kz
School of Science and Technology	sst.nu.edu.kz
School of Mining and Geosciences	smg.nu.edu.kz