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Building local research capacity in higher education: a conceptual model

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ABSTRACT

Building local research capacity is an enduring challenge that confronts many higher education systems particularly when aspirations for a knowledge economy dominate policymaking. While research capacity has received tremendous attention among international development agencies and scholars, the discourse is largely oriented towards infrastructure, skills training and best practices. This study interrogates the concept of *local research capacity building* as a dynamic process. By contrasting the policy rhetoric with the lived experiences of academics based in Kazakhstan, we propose a conceptual model to illustrate the diverse levels of research capacity building: resources, locality, relevance, human capital and culture. This study examines research capacity building in the context of the internationalisation of higher education as researchers become increasingly mobile. We argue that investing in infrastructure and human capital are insufficient for capacity building. Rather, sustainable capacity building requires research that is relevant to the local context and a cultural environment that can nurture a vibrant research community.

KEYWORDS

Capacity building; research capacity; higher education; knowledge production; internationalisation; local development

Introduction

In many discussions on globalisation and economic competitiveness, knowledge occupies a central role with its seemingly boundless potential to trigger growth, ensure national welfare and facilitate social development. Policymakers from both developed and developing countries celebrate the potency of knowledge, irrespective of sharp differences in educational and economic contexts (King, 2011; Peters, 2006). In these normative castings, knowledge appears in diverse reincarnations: the service sector, digital literacy, higher education, research and innovation. Countries that experienced impressive economic growth coupled with higher education expansions further give credence to the role of knowledge. For example, Taiwan and South Korea's rapid ascent in technology export and higher education participation over the last three decades have caught the attention of many developing countries. More germane than the concept of knowledge as a panacea is the *process* of knowledge production. If the utopian vision is a knowledge economy, how does a country actually generate

knowledge? For many developing countries and transition economies, the immediate challenge is *research capacity building* (Kruss, McGrath, Petersen, & Gastrow, 2015). Inadequate research facilities and staffing have led to global inequities in knowledge production, which are predicted to widen in the future (Sanyal & Varghese, 2006).

Research capacity building is a formidable challenge that has attracted serious attention and resources from governments and international organisations since the 1980s (UNDP, 1998; World Bank, 2005). As institutions of advanced research, universities play a pivotal role in building a country's research capacity. While knowledge production is not the exclusive purview of higher education, universities forge the frontiers of knowledge in many societies. More specifically, academics play a critical role as *knowledge workers* (Druker, 1959). Despite the rhetoric of national competitiveness, King (2011) argues that global science relies heavily on an elite group of researchers who operate on individual ties rather than national frameworks. King contends that these ties are not necessarily positive because they result in gatekeeping and exclusionary practices. 'Western control and bias still predominates in this emerging geography of scientific knowledge' (King, 2011, p. 360). To shed light on the fault lines of this geography, this study focuses on local research capacity building in Kazakhstan, a Central Asian country with a history of internationalisation as a mechanism of capacity building in higher education. This inquiry seeks to understand the perspectives and agency of academics through the following research questions: How do academics in Kazakhstan interpret policies on local research capacity building? How do academics conceptualise local research capacity building? What strategies do academics pursue to build local research capacity? This study does not seek to investigate how academics influence policy given that policymaking is heavily top-down in states with centralised authority such as Kazakhstan.

Kazakhstan is an important case study for research capacity building for multiple reasons. Kazakhstan is undergoing socio-economic transformations and implementing dramatic reforms in higher education oriented toward research (Aitzhanova, Katsu, Linn, & Yezhov, 2014). Although universities in Kazakhstan are largely teaching oriented like many universities in the Global South, there is a strong directive from the state to pursue research. More importantly, Kazakhstan has a history in the internationalisation of higher education through academic mobility (Lee & Kuzhabekova, 2018; Perna, Orosz, & Jumakulov, 2015). Lately this internationalisation effort is shifting from the traditional staple of teaching to research. It is important to clarify that this paper is not an evaluation of Kazakhstan's research performance. While research metrics and global rankings of universities attract enormous attention, an accounting of publications, patents and doctorates does not fully capture the complexity of capacity building.

The paper will first provide a brief overview of Kazakhstan then review key concepts in capacity building as found in the literature. The methodology section will provide details on data collection, participant demographics and data analysis. Key findings will be presented and synthesised into a conceptual model to elucidate research capacity building. Finally, we conclude by presenting the implications of our work for policy-making and future research.

Context

Kazakhstan is an upper middle-income country with an ambitious development agenda. Wedged between two giants, Russia and China, Kazakhstan occupies a vast

territory that equals the size of Western Europe and nearly a third of the United States. The country emerged from Soviet industrialisation and created an economy dependent on oil, gas and mining. After gaining independence in 1991, many successive policies call for ‘modernisation’ by improving the quality of education and diversifying the economy (Aitzhanova et al., 2014; Nazarbayev, 2012). Kazakhstan’s goal of becoming one of the 30 most developed countries in the world by 2050 is ubiquitous in many policy initiatives. Noticeable changes in higher education include the active courtship of international actors to the creation of new institutions and research schemes (Lee & Kuzhabekova, 2018). Leading universities in the country such as KIMEP University, Kazakh British Technical University, and Nazarbayev University all emerged through international partnerships.

Research funding in Kazakhstan comes mainly from the state with limited participation from industry. Gross domestic expenditure on research and development (GERD) is quite low compared to other countries: 0.17 per cent of GDP in 2013 (OECD, 2017). A general pattern is that developing countries invest less than 1 per cent GDP in R&D while almost all developed countries invest more than one per cent (Sanyal & Varghese, 2006). Higher education institutions in Kazakhstan receive only 30 per cent of the public research funding while independent research institutes receive the remainder (OECD, 2017). While there is an ongoing effort to promote research at universities, advanced research in Kazakhstan has historically taken place at these independent institutes due to the influence of the Soviet model of higher education. These institutes are highly specialised and connected to industries (Smolentseva, Huisman, & Froumin, 2018). Apparent in the research landscape of Kazakhstan is also a strong orientation toward scientific areas aligned with national priorities and commercial interests (OECD, 2017).

Literature on research capacity building

The literature on research capacity building comes largely from the field of international development with minor contributions from higher education. Decades of lacklustre outcomes in international development have led to calls for empowerment through local capacity building (European Commission, 2008; World Bank, 2005). Therefore, grey literature by practitioners far eclipses academic literature on this topic in terms of volume. This section will first review the various definitions and interpretations of capacity building then identify crosscutting patterns and themes.

What is research capacity building?

The United Nations Development Programme (UNDP) provided some of the earliest conceptual ideas on capacity building. In a report in 1998, capacity is defined as

the ability of individuals and organisations or organisational units to perform functions *effectively, efficiently and sustainably*... Capacity is the power of something (a system, an organisation, a person) to perform or to produce. (UNDP, 1998, p. x)

This definition highlights instrumental performance as well as longevity in engagement – key characteristics which are also supported by the European Commission and the Canadian International Development Agency (CIDA):

Capacity development refers to the approaches, strategies and methodologies used by developing country, and/or external stakeholders, to improve performance at the individual, organisational, network/sector or broader system level. (CIDA, 2000, p. 2)

The 1998 UNDP report also stressed that capacity is not a fixed state but rather a condition that changes with time. Therefore, the UNDP prefers to use *capacity development* to emphasise an iterative process that is relevant to many contexts rather than *capacity building*, which may suggest zero capacity (UNDP, 1998). While this semantic difference is not universally adopted in the literature, it does recognise the inherent capacity in every individual and organisation. Some scholars and institutions also prefer the term *capacity strengthening* for the same reason (*Changing Mindsets*, 2008; Nchinda, 2002; Nuyens, 2005). Others recognise an iterative process without adopting new terminologies: 'The focus of capacity building therefore tends to be on improving the stock rather than on managing whatever is available' (Paul, 1995, p. 3). We use the term *research capacity building* because it is the most widely used term in literature. Unlike the UNDP stance, we do not use *capacity building* in a negative sense to imply zero capacity.

In 2008, the UNDP updated its definition on capacity building as

the process through which individuals, organizations and societies obtain, strengthen and maintain the capabilities to set and achieve their own development objectives over time (UNDP, 2008, p. 4)

This revised definition now emphasises local ownership and agency in development, which other organisations also advocate (e.g. German Corporation for International Cooperation). Other definitions go further to include downstream knowledge dissemination and uptake as an integral part of research capacity building (Jones, Bailey, & Lyytikäinen, 2007; Nuyens, 2005).

A separate but related body of literature on innovation also addresses research capacity. Discussions of national innovation systems first appeared in the 1980s, but the foundational ideas can be traced back to Adam Smith's treatise on the division of labour (1776) and Friedrich List's concept of national systems of production (1842) (Kruss et al., 2015; Lundvall, Johnson, Andersen, & Dalum, 2002). Studies on national innovation systems occasionally implicate universities as a source of innovation, but the discourse is largely preoccupied with technology diffusion and corporate benefits (Lundvall et al., 2002; Watkins, Papaioannou, Mugwagwa, & Kale, 2015). Innovative capability and economic growth appear prominently in this literature. While this large body of literature is vital to the broader conversation on knowledge production, it is also beyond the scope of this paper. Designing and conducting research in academia also differ sharply from research in industry. However, one of the few studies that examine the intersection of science policy, research capacity and higher education is the work by Heitor, Horta, and Mendonça (2014). This case study on Portugal illuminated a neglected liminal space, but it also retains a fixation on human capital, research funding and publications as measurable indicators of research capacity. Building on this work, our interest is to understand research capacity building as a dynamic *process* through the experiences of academics.

Levels and power dynamics in research capacity building

Some practitioners dissect research capacity building into different levels to provide an analytical framework for planning and evaluation. The UNDP has identified three levels of capacity building: 1) individual, 2) entity and 3) system (UNDP, 1998, 2008). Research capacity building at the individual level is the most common one in practice because many projects focus on training individuals, especially in the 1970s and 1980s (ESSENCE, 2014; Nuyens, 2005). Training includes doctoral education, apprenticeship and mentorship. An entity is an organisation, which requires appropriate leadership, policies, workflows and management to support individual performance. A system is the environment within which individuals and entities operate. A supportive system has policies, legislations, power relations and social norms that facilitate performance (UNDP, 2008). In the 1990s, the World Bank identified four similar levels that are vital to capacity building: 1) human resources, 2) organisational processes, 3) physical resources and 4) external supports (Ohiorhenuan & Wunker, 1995). Similarly, Lansang and Dennis (2004) mapped out five levels for research capacity building in the health sector: 1) individual, 2) institutional, 3) organisational, 4) national and 5) supra-national. While it is unclear how Lansang and Dennis differentiate between institutional and organisational, others use these terms interchangeably. The World Bank (2005) has defined institution as a socio-political concept to mean the formal rules and informal norms in society such as taxation, transparency and regulatory framework. In this interpretation, institution occupies a meso level of operation. In studying health and welfare planning in India, Potter and Brough (2004) dissect research capacity building into nine different types of capacity: performance, personal, workload, supervisory, facility, support service, systems, structural and role. While this is the most comprehensive categorisation to our knowledge, the model focuses on human capital, infrastructure and work flow management. By infrastructure, we mean physical space and equipment for research. As evident in these various frameworks, there is significant overlap and repetition in the literature on the levels of capacity building.

Conceptual ideas about research capacity building have also elicited strong criticisms from practitioners and scholars. Schacter (2000, p. 1) points out that capacity building has become an 'all-encompassing a term as to be "useless" from an analytical and practical point of view'. Similarly, Potter and Brough (2004, p. 337) argue that capacity building 'has become an over-pompous synonym for training'. A critique against the narrow focus on individual capacity and resource acquisition (e.g. lab equipment) is noticeable in the literature (Harris, 2004; Jones et al., 2007). The failure to monitor and evaluate capacity building work is another line of critique (ESSENCE, 2014; World Bank, 2005). Finally, the Global North often leads and dominates capacity building initiatives, which target the Global South (Barrett, Crossley, & Dachi, 2011; Harris, 2004). The history of international aid is replete with donors who lack contextual knowledge, marginalise local input and prescribe Western ideas of development (King, 2007).

Several additional themes and patterns can be identified in the literature on research capacity building. The most conspicuous pattern is the assumption that capacity building is only relevant to the Global South. Africa is the focus of many studies. Furthermore, practitioners and scholars conceive research capacity building mainly as a one-way process whereby experts impart knowledge to recipients (Mark & Nakabugo, 2011).

This parochial deficit model of capacity building is prevalent in the literature even though the Global North also contains individuals and institutions that lack research expertise. Lastly, while the grey literature on research capacity building is extensive, empirical evidence is conspicuously missing. Instead, this body of literature is practice-oriented and based on reflections rather than scholarly inquiries. Our study aims to address the gaps in literature on three fronts: first, by questioning the assumptions about research capacity building; second, by focusing on the lived experiences of researchers working in higher education institutions; third, by illuminating the tensions in the internationalisation of higher education. Our inquiry seeks to understand the process of building research capacity rather than evaluate the outputs and performance of a system.

Methodology

To fully understand the lived experiences of academics, we conducted interviews at several universities in Kazakhstan. Data collection took place in the two largest cities in the country (Almaty and Astana) because higher education institutions are concentrated in these urban centres. Interviews were conducted with both international and local faculty members who met two basic criteria: 1) employed full-time in Kazakhstan and 2) be active in research with ongoing project(s). Participants were asked to briefly describe their ongoing research projects at the beginning of the interview to ensure credibility as individuals who encounter research capacity building. In addition to these criteria, the study used maximum variation sampling to gather a diverse set of participants based on age, discipline, rank, institution and country of origin. Altogether, 44 academics were interviewed for this study: 26 expatriates and 18 locals. The participants represent 18 disciplines and 7 institutions. The most common disciplines are engineering, business and political science – each with four participants. The institutions include small, specialised research institutes, private universities and large, public universities. Participants held the rank of assistant (23), associate (10), full professors (7), deans (3) and director (1). Among the expatriates, they represent 14 countries; their experiences as academics in Kazakhstan range from one year to 20 years with the majority coming to Kazakhstan in the last five years.

Interviews were audio recorded, transcribed by two research assistants and thematically coded by the two principal investigators independently. Coded themes were then compared and crosschecked to ensure both validity and credibility. Specifically, the research team met several times to clarify themes, re-sort attributing quotes and verify links to the main research questions. To ensure reliability, follow-up discussions were held with research participants if segments of the audio recording were unclear or contradictory. The goal of the data analysis was to identify the diverse interpretations of local research capacity building rather than to determine a consensus or the most subscribed views. Triangulation with institutional administrators, colleagues and national policymakers was not done because the study targets the subjectivities of lived experiences from diverse disciplines and institutions rather than the objective performance of a research system. The experiences of academics in Kazakhstan exemplify *lived space* as individuals construct meaning from their interactions with the environment (Rich, Graham, Taket, & Shelley, 2013).

The quotes used in this paper are attributed to research participants using pseudonyms. For expatriates, the country of origin is not revealed because this information may compromise the identities of those working in niche fields. The quotes come

largely from expatriates because many are active researchers recruited by Kazakhstan in its effort to build research capacity.

Findings

Interpreting research capacity building as a policy directive

We first asked participants to interpret Kazakhstan's drive toward research capacity building. This drive is not contained within one policy but rather pervasive across multiple policy platforms: Kazakhstan 2050 Strategy, State Programme for Education Development 2011–2020, Programme on Formation and Development of the National Innovation System for 2005–15, and Plan of the Nation: 100 Concrete Steps. These policies emphasise the integration of education, science and industry plus the commercialisation of research. At the institutional level, the growing awareness of research is also shaping policies in human resource management (e.g. hiring and promotion) and student graduation requirements. Many participants viewed the country's substantial interest in research as a strategic move that mimics many higher education systems worldwide in order to compete and excel in rankings, which favour research metrics. Others attribute the interest to Kazakhstan's anxiety over its monolithic economy, which relies on oil and gas; research is therefore perceived as a pathway for economic diversification. Some participants pointed out that the discourse on research heavily favours STEM fields and applied research.

The government is interested in money. They want investments and prestige. They want to put their country on the world map. They want more influence. They want better trade deals and deals with corporations. (Lance, international, Physics)

They [state] have a much more applied focus than fundamental research focus, and that direction is good because the country, being a part of the former Soviet Union, has a tradition in fundamental research. If researchers were left alone, they would continue conducting theoretical research for the foreseeable future. (Karim, international, Robotics)

From a more critical perspective, some participants argued that the discourse on research capacity building in Kazakhstan is largely about rhetoric and performance; the former lacks action while the latter executes a contrived response to appease central authority:

Just by having foreign researchers here, that makes them a 'research university'. I think the interest is almost to present the outward appearance that research is happening. (Natasha, international, Chemical Engineering)

When I first got here, I was really intimidated when people asked, 'How many publications have you done this year? I have done 60'. Or PhD students telling me, 'Yeah, we have to publish 10 articles per year'. Then I figured out those numbers include things published in newspapers and in the basement of your own university. (Rebecca, international, Linguistics)

Policymakers and institutional leaders are therefore leveraging the discourse of research to raise national and institutional visibility. While all participants were cognizant of the country's intense interest in research capacity building, many stopped paying attention to new policy formulations on research and innovation due to cynicism.

Conceptualising local research capacity building

Participants also shared their conceptions of local research capacity building and gave examples of their direct engagements. Many participants quickly identified infrastructure and funding as key strategies of capacity building. This normative, quantitative view of capacity building is widely documented in the literature as resources.

As data collection proceeded, some participants challenged our usage of the term 'local research capacity building'. These participants asked for clarification on what constitutes *local* and argued against the artificial binary of international and local:

It doesn't matter if it's research capacity building or *local* research capacity building. It doesn't matter who is doing the research: locals or foreigners. At the end of the day, the thing is the physical results because we don't deal with social aspects. A good researcher is a good researcher. A bad researcher is a bad researcher too! We don't care where he or she is coming from! (Marcel, international, Chemistry)

This provocative view on human capital forced us to reflect on the discourse of capacity building, which is inherently about indigenous human capital and self-determination. Initially, we suspected that only scientists and engineers held such a stark view on meritocracy as proponents of positivism and universal standards of science. As Francis Fukuyama argues, 'merit and results trump any consideration of national origin or jurisdiction' in global science (Fukuyama, 2008, p. 1–2). However, some social scientists and locals also supported this view:

I get quite upset about the distinction. I have been here for five years, and some people have been here for 15 years. Why are they at this point still not local because they were not born in Kazakhstan? To be honest, I think the local/foreign distinction breeds suspicion more than anything else. (Louise, international, Linguistics)

We do not look at where the person comes from. It does not matter for us the nationality or country of origin... I don't think that it is going to be only people who are born here, raised here, will do research about Kazakhstan. If that is the case, I don't think that the research will make great impact. (Azamat, local, Business)

The country where the person is trained is not so important as the quality of the training. A person can come from China, Russia or US, Japan. It doesn't really matter where he or she would come as long as they have proper research training and graduate education and good academic track record. (Vlad, local, Physics)

These remarks raise many complex questions about the normative definition of *local* in the discourse on research capacity building and challenge our biases as researchers. Who qualifies as a local? Is this a status based on birth, citizenship, family ties, formative education experience, employment or residence? For the expatriates in our study who have lived and worked in Kazakhstan for over 10 years, is it fair to continue calling them international faculty members and subsume them in the discourse on the internationalisation of higher education? Subsequently, this conceptual conundrum compelled us to re-examine our data and refine our understanding of local capacity building. The term *local* is not simply an issue of human capital. Rather, participants spoke about 'local' in divergent interpretations, as the following discussion will illustrate. These interpretations contribute to our conceptual model as depicted in Figure 1.

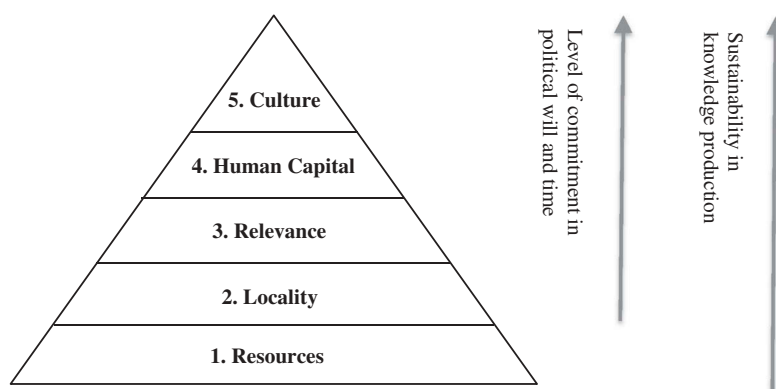


Figure 1. Conceptual model for local research capacity building.

Research capacity building as locality

Some participants conceptualised research capacity building as the locality of work (i.e. the physical location where research occurs). While this point may seem pedestrian in any discussion on local research capacity building, technological advances and international mobility now offer many possible spatial arrangements in research (Jacob & Meek, 2013). The following quotes emphasise locality:

Anybody located in the region can do capacity building – that is important. ‘Who are the people’ does not matter, but what matters to a big extent is where they are actually physically located. (Theo, international, Computer Science)

Publications that come out of the researches here are affiliated to Kazakhstan. So, we are part of the local research capacity. (Leonard, international, Political Science)

Participants who hold this view clarified that local research capacity building should ideally involve local researchers; however, this process should not exclude the work done by foreigners based in Kazakhstan.

Research capacity building as relevance

Another interpretation of *local* is the relevance of the research to the local context. While *local* in terms of human capital and locality receive moderate to strong support from participants, this interpretation elicits polarising views because it begins to challenge the *principles* of science (how) rather than the *organisation* of science (who, what and where).

For research capacity building, I think we need to look at building a base. I don’t think we have a base yet. This base should be on two fronts: 1) It should be Kazakhstan relevant research and 2) research areas which have global relevance. (Nazir, international, Information Management)

If the research is funded by Kazakhstan government, I think it is perfectly valid that I do something that is going to benefit the people of Kazakhstan. But that does not need to be such a narrow view. There are lots of things that can benefit people in Kazakhstan that are not just about Kyzylorda¹ or oil and gas. (Louise, international, Linguistics)

What is considered locally relevant research? When asked if local research capacity building should align with the list of national priority areas as identified by the

government, strong dissent emerged. A few participants deemed the list useful as a strategic plan for the country, but the vast majority recoiled at the thought of government bureaucrats steering the direction of research for the sake of capacity building:

You cannot impose on a researcher what to do research on. That is nonsense! When you are told what to do research on, that is a problem because what if the government is wrong with the priorities? They can be right, or they can be wrong. No one knows... What if something new pops up that is not on the priority list? (Matthias, international, Political Science)

They have some flavours of the month. So if somebody says 'nanotechnology', then it's 'Oh yah, we need to have nanotechnology'! If someone says 'cloud computing', then they'll do something in cloud computing... A new guy [bureaucrat] comes and proposes new things. And how is that connected to Kazakhstan? (Nazir, international, Information Management)

Many participants repeatedly pointed out that scientific inquiry should be driven by curiosity and informed decisions based on developments in their fields. This curiosity does not necessarily exclude locally relevant topics. For example, Nazir, dismissed national priority areas as misinformed directives, yet he embraced research that could ameliorate local health epidemics.

Research capacity building as human capital

Most participants conceptualised capacity building foremost as a process of educating and training individuals just as previous studies have shown (Heitor et al., 2014). The quintessential human capital perspective was dominant in many interviews:

You need to find people who can actually design the research (come with the ideas) and do the research, so those are the two main active parts... This is the visible side of the iceberg. (Marcel, international, Chemistry)

For several interviewees, building capacity does not extend beyond unidirectional knowledge transfers. International faculty often viewed themselves as experts who were hired to initiate or expand research at their institutions. However, two participants clarified that their role is actually not to impart knowledge but rather to cultivate human potential:

I don't see myself as a guru to be honest or strong in any area. But I try to get people interested in something. The students! I see myself more as a curator. I can curate a lot of material, put them together, pass them to my students, and try to explain how these jigsaw puzzle pieces fit together. So in many of our efforts, the students are the people who actually take the lead. (Nazir, international, Information Management)

I do not see any necessity of doing anything to build research capacity honestly. I am telling you because the new researchers [locals] have got PhDs from abroad. It is as simple as that. My boss has his PhD from Harvard, a friend with a PhD from Cambridge, another one from Oxford. I do not need to teach them... The simple thing is just to give them an opportunity. (Matthias, international, Political Science)

While these more equitable and sanguine views are unusual among participants, these comments are nevertheless still about human capital and individuals as the default level of capacity building. Furthermore, participants' reference point on human capital is almost exclusively about students rather than colleagues. Interviewees gave countless examples of training graduate students, mentoring bright undergraduate students and securing internships or admissions into graduate programs abroad for such talents. They attributed the

limited engagement with local researchers to a litany of barriers: lack of English, incompatible research interests, gaps in foundational knowledge, heavy teaching load and distrust.

Research capacity building as cultural shifts

Participants also shared countless stories on systemic barriers to research. These barriers include rigid policies that demand immediate, tangible results from research, heavy teaching loads, poor salaries for academics, a widespread distrust of expenditures on research, and stereotypes that treat universities as merely places of teaching and learning rather than research. Nearly every participant identified bureaucracy and unhelpful administrative staff as major barriers to research:

What is maybe even more vital for research capacity than faculty is all the support. Admin staff has to understand how to handle budget correctly, how to help you, and not how to tell you that you can't do that, but find a way for you to do what you wrote and what was approved – so this is what I would say is soft capacity. (Marcel, international, Chemistry) My department chair was nice. She understood that research is the way we should be going, but she was not able to push it forward. The environment at the university did not support this. (Theo, international, Computer Science)

An exasperated local mathematician suggested more drastic changes:

To develop the scientific potential, it is necessary to get rid of some people here. There's the saying: *You cannot change people*. We have a problem: nepotism. In mathematics, we are stronger than foreigners. It's just that foreigners have no laziness. They are efficient, and they are not capable of corruption. (Nurlan, local, Math)

Many participants expressed similar frustrations with institutional and societal culture as non-conducive to research. These examples illustrate the critical role of culture in sustaining capacity building (Marjanovic, Hanlin, Diepeveen, & Chataway, 2013; Potter & Brough, 2004; UNDP, 2008)

Discussion

Conceptual model for local research capacity building

From the diverse views of our participants, we developed a conceptual model for local research capacity building to guide future analyses and discussions (Figure 1). Unlike numerous existing models that define levels of research capacity building as the scale of operation (individual, institutional and national), we defined levels based on the *sustainability* of knowledge production. Each successive level demands greater commitment toward local ownership. This conceptual model is applicable to institutions and systems that seek to develop research capacity rather than restricted to the context of the Global South.

At the most elementary level, local research capacity building requires adequate resources to establish infrastructure and fund projects (first level in Figure 1). Both the literature and data from our study do not dwell on this basic requirement because it is implicit in capacity building. Beyond resources, research capacity building requires work that is conducted in-situ irrespective of the identities and origins of the researchers. Locality (second level) requires a low level of political commitment because this type of capacity building is largely an operational decision with little consideration for human capital and

topic relevance. Admittedly, this approach to research capacity building may lead to exploitative data mining by outsiders (Fahey & Kenway, 2010). The sustainability of such knowledge production is dubious when the endeavour may be detached from the local context. Singaporean universities and the King Abdullah University of Science and Technology in Saudi Arabia exploit locality very well as they recruit high profile foreign scientists to lead laboratories staffed with international graduate students. Similarly, United States and Great Britain have exploited locality for many decades as academics migrate to the West. Even if these foreign academics return to their home countries, the West has reaped the benefits of their scientific contributions.

The third level of local research capacity building is research topic relevance. If the research addresses a local issue, research becomes embedded in the local context and generates potential benefits for the local society (Singh, 2011; Tijssen & Kraemer-Mbula, 2018). An Italian biologist based in Kazakhstan could investigate the declining sturgeon population in the Caspian Sea and contribute to local conservation measures. By emphasising topic relevance, we are not advocating that research becomes shackled to national priority areas as defined by the state – an unwelcome arranged marriage between a statist vision and scientific inquiry as our participants pointed out. Rather, we stress the necessity for some research to address local challenges if research capacity is to be sustained. Recognition of the local context also avoids scientific hegemony when countries coalesce around similar research agendas such as genetics and nanotechnology (R. King, 2011). Local relevance is not simply an issue facing the Global South. Many European funding initiatives carefully consider potential impact on local society when assessing grant proposals. Policymakers are also increasingly expecting research to solve complex societal problems (Barrett et al., 2011).

Beyond resources, locality and relevance, the fourth level of research capacity building is local human capital. A local is liberally defined here as a researcher who is based in the country and pursuing a medium to long-term future in the country. We avoid defining local on the basis of ethnicity and citizenship given the increasing mobility among skilled professionals today (Heitor et al., 2014; Yudkevich, Altbach, & Rumbley, 2017). Our definition of local includes the indigenous population, the repatriated elite with degrees from abroad and immigrants. Some expatriates in this study have worked in Kazakhstan for over 10 years or married Kazakhstanis, and they consider themselves as locals in many respects. Similarly, some Kazakhstani researchers in this study returned to Kazakhstan only recently after several years in the West as graduate students or professors. Altogether, these individuals constitute 'local human capital' if local research capacity building is meant to be an inclusive endeavour. An emphasis on local human capital requires greater political commitment than locality and topic relevance because this level demands astute planning in education, training, recruitment and talent development, which are fundamental to the sustainability of knowledge production.

The ultimate level of local research capacity building is to foster a culture that can support and stimulate research. A cultural shift to embrace research requires both new competencies and attitudinal changes in managing research. Without substantial changes in culture to support research, capacity building stagnates at lower levels in our conceptual model. Granted, any substantial change in culture requires a concerted effort from national policymakers, institutional leaders and administrators who interact with researchers. Such a change also demands time as administrators develop skills to

manage and support research (Marjanovic et al., 2013). Ultimately, the most comprehensive and sustainable approach to local research capacity building encompasses all levels of our conceptual model (Figure 1).

Our model echoes some of the ideas Potter and Brough (2004) proposed in their comprehensive analysis of capacity building in the healthcare sector of India. They pointed out that three types of capacities require the longest time to build: structural, system and role capacity (i.e. clear accountability and authority). We agree with this assessment, but their 9-level model stresses infrastructure and the management of workflows. While operational details are important, our conceptual model interrogates the concept of *local*, which is noticeably absent in the literature. In essence, the discourse on capacity building stresses efficiency and effectiveness according to the UNDP (1998) definition but largely ignores sustainability. In the case of Kazakhstan, the country has made moderate progress in research capacity building in terms of resources (infrastructure and funding), locality (research at universities), relevance (national priorities), but human capital and culture still require significant attention for a sustainable development.

Conclusion

We analysed the experiences of academics in Kazakhstan to build a conceptual model for local research capacity building. Our constructivist approach captures the diverse interpretations of *local* rather than assume there is a universal, correct or best pathway to build research capacity. Policymakers and institutional leaders may pursue different levels of research capacity building in our model based on their priorities and constraints. For example, an international donor agency may invest in infrastructure (resources) while giving less attention to human capital or topic relevance in the research. A state may selectively fund research in national priority areas (relevance) and scholarships for international mobility (human capital) while neglecting the hard work of changing cultural attitudes that hinder research.

Our findings can stimulate policymaking and assessment of local research capacity building. Policymakers and institutional leaders may ask themselves: what level of local research capacity building are we aiming for? Which levels do we have strengths and shortcomings? Which level is the most feasible at the moment? What strategies can promote research on locally relevant issues? Hosting a national or regional conference may generate greater interest in local issues than enforcing a list of priority areas for funding. While research capacity building may occur only at one level in our conceptual model, sustainability in knowledge production requires that most if not all levels should receive adequate attention in policymaking and implementation.

This study's focus on the lived experiences of academics in Kazakhstan presents some limitations and uncharted territories that future research can explore. Namely, academics represent only one type of actors in research capacity building. Research systems vary significantly in the composition of actors (academic, industrial, public, private), the balance between basic and applied research and the governance that regulates resource distribution and strategic planning. A study that includes different actors even within the higher education sector would provide a more comprehensive assessment of capacity building (e.g. national policymakers,

funding agencies, university presidents and research managers). Further research may also investigate the path dependency of research capacity building. Is one level of our conceptual model a prerequisite for another level? Do achievements in one level generate positive spillover effects on another level? Can capacity building be regressive such that achievements in one level become lost over time due to neglect? These questions require further research to refine our conceptual understanding of local research capacity and create policies that truly lead to sustainability in knowledge production.

Note

1. A city in southern Kazakhstan.

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