Ministry of Education Youth and Sport
Education Research Council

Article

Current State, Key Challenges and Ways Forward for Cambodian Research Capacities: A Review of Four Studies

Phyrom Eam
Research Associate, Cambodia Development Resource Institute (CDRI)

Received 18 April 2018; Accepted 19 May 2018

Abstract

This review paper examines four studies that tap into the current state and challenges of Cambodia's research capacities. These four studies identify systemic gaps in Cambodia's research capacities. However, they also acknowledge some positive changes of research development endeavors at certain Cambodian institutions. The remaining challenges include issues of the capitalization and utilization of financial resources, the optimization of academic infrastructure and culture, political influences, and individual and collective research competencies. These challenges make up an ecosystem that decelerates all kinds of research development endeavors in Cambodia, such as building a research culture, developing research competencies, increasing research productivity and commercializing research outputs. The four studies, therefore, suggest both systemic changes and programmatic interventions directed towards different stakeholders at different levels, from generating research funding to systemizing academic careers and creating long-term collaborative research development platforms. These studies reveal many practical truths and are thus basic groundworks for further, more focused and more analytical research studies on the topic of research capacities in the Cambodian context.

Citation: Eam, P. (2018). Current State, Key Challenges and Ways Forward for Cambodian Research Capacities: A Review of Four Studies. *Cambodia Education Review, 2*(1), 108-143.

Background

The roles that scientific discoveries and advanced research have played in many countries in establishing the foundations for economic development teach Cambodia and other developing nations to be critical of their research, science, innovation and technological capacities. It should be noted that the models utilized around the world today – for example, capitalism in economic and financial terms, scientism in intellectual terms, and/or technologism in material terms – have all developed from the scientific revolution and scientific research. Similarly, the academic and higher education sector of a nation is one of the key engines for the scientific culture and research that allows that country to function and grow. This sector is, therefore, an important hub for the intellectual independence of a nation. To compete in this global and knowledge-based era, a nation has to be clear and strategic with the relationship between national intellectual independence, scientific culture, and academic and knowledge systems. Such concepts are easily mimicked but deep wisdom and the tangible mechanisms to realize them are often deficient.

For Cambodian millennials and post-millennials,[1] technology is an important part of their everyday life, just like their generational cohorts in other nations. They adapt smoothly into the technological world. So, in terms of technology, the focus should be on how Cambodians can exploit it in an innovative way and for positive gains. How to advance research and science in academia is perhaps of greater foundational concern than technology in the eyes of critical Cambodian development observers and thinkers. The reason is that science and research are the foundation for critical and innovative thinking and can offer a systematic and evidence-based approach to reveal truth and solve many of the deep-rooted problems a society is facing.

[1] Millennials (or Generation Y) refer to the generation of people born between 1980 and 1997 and post-millennials (or Generation Z) refer to those born after 1997 to the present day (Holton & Fraser, 2015, p. 7). The age range varies slightly in different studies.

The promotion of research and science is one of the prioritized strategies in the agenda of the Cambodian higher education sector (as denoted in the Cambodian government's *Policy on Higher Education 2030* and other related policies). The World Bank co-funded the Development and Innovation Grants (DIG) scheme[2] and the proposed project for Cambodian higher education development (with a loan worth of somewhere between US $90 to $100 million) also constitutes partial aims to contribute to elevating research capacities and building a research and scientific culture in Cambodia. At the institutional level, most major Cambodian universities have research stated as one of their core missions, while some have staff engaging in ongoing commissioned research projects.[3] A number of people also include students' research (as discussed by Kwok et al. (2010)) – that is, research as part of their learning process – when it comes to research engagement in Cambodia.[4]

Other non-academic sectors in Cambodia – such as non-governmental organizations (NGOs) and public research institutions – engage in research as part of their missions. Some of these institutions include the Cambodia Development Resource Institute (CDRI), the Center for Khmer Studies (CKS), the Center for Advanced Study (CAS), Institut Pasteur du Cambodge, the Cambodian Institute for Cooperation and Peace (CICP), the Supreme National Economic Council (SNEC) and the Cambodian Agricultural Research and Development Institute (CARDI).

There is little information on market research and/or industrial research and development in Cambodia, despite the fact that these also exist in the business sector in some very limited ways. Indochina Research Ltd, for example, may fall into this category of private institutions that engage in market research in Cambodia and the surrounding region.

To have a thorough understanding of these patterns of research in Cambodia and the general state of the country's research capabilities, we

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[2] DIG is a core part of the Higher Education Quality and Capacity Improvement Project (HEQCIP) 2010–2015 (with a total grant of US $23 million).

[3] These institutions will be specified in the following sections.

[4] This idea is generally criticized as a misconception of academic research because students' research works, in real practice, are seen as mere looking for information that they can write up in their course assignments. Even if those students' research is in the form of thesis writing (with the whole procedure and format academically styled), those works are generally noticed to be less scientific in approach or less academic in terms of level of criticality, validity and quality.

need to turn to previous literature on this particular area. An important area to study is the "research on the state of research"[5] in a nation, which is a critical discourse for intellectuals and policy-makers. Using various research-related variables and statistics, the Institute for Statistics of the United Nations Educational, Scientific and Cultural Organization (UNESCO) has established a mega database on the research and development of many countries in the world. The database aims to contribute to making knowledge about the state and conditions of national research and development publicly available. UNESCO also publishes science reports every five years in order to disseminate and update data and information on the investment, resources and productivity of research, science and innovation of many countries around the world. There are other global endeavors, such as from academic databases and academic research areas (i.e. scientometrics and bibliometrics), that create stocks of knowledge on this "research on the state of research" area. However, all those databases and reports may offer limited critical information and in-depth insights on the conditions and challenges of research in a country like Cambodia. For example, the information and data on the research and development of Cambodia in the UNESCO database are missing for many years and some particular information just does not exist.

Therefore, to holistically and critically comprehend the state of research in Cambodia as well as identify its challenges and development approaches, it is necessary to review and critique local literature. While this may not cover all aspects or sectors, it can offer a great deal of contextual knowledge and insights.

Introduction to the Review

Although research studies on the state of research in Cambodia are not abundant, some do exist. Examining these studies will allow researchers to master contextual knowledge on the issues in Cambodia and to foresee future research development opportunities in clearer and more strategic ways. Four studies were selected for examination:

- ***Study 1:*** "Scoping Study: Research Capacities of Cambodia's Universities"

[5] "Research on the state of research" is the term used by Mary-Louise Kearney in the foreword of the edited book *Universities as Centres of Research and Knowledge Creation: An Endangered Species?*.

- ***Study 2:*** "Engagement between the State and Cambodian Researchers"
- ***Study 3:*** "Higher Education Quality and Capacity Improvement Project (Development and Innovation Grants): Stocking Report"
- ***Study 4:*** "Doing Research in Cambodia: Making Models that Build Capacity"

The first study was published in 2010 by CDRI and co-authored by researchers from other partner institutions. It is the foremost study of the research capacities in the Cambodian university sector. In the form of a report, this document offers very comprehensive and descriptive information on research in Cambodian universities and provides multiple insights on the topic, using interview data from senior university leaders and key players in the Cambodian higher education sector.

The second study was published four years later by the same institution (CDRI). Dr. Eng Netra was the sole author. The study explores the challenges of research in Cambodia but examines these challenges from a very specific political perspective. It does not just examine academic institutions but looks at research in the country in general. In this article, the author – whose background is in governance – discusses the influence of politics on research engagement, albeit in a very approachable and constructive way. Among the four studies reviewed, this second piece takes the most clearly argumentative standpoint.

The third piece was written specifically as a report following the implementation of a large-scale higher education promotion project for Cambodia called the Higher Education Quality and Capacity Improvement Project (HEQCIP), which was supported by Ministry of Education, Youth and Sport (MoEYS) and the World Bank. It was published in 2015 and authored by consultants working for MoEYS and the World Bank. Using interviews, surveys and program document analyses, the study evaluates and reflects on what was experienced, produced and perceived by the university-based participants who were the implementers, leaders and/or relevant stakeholders in the DIG scheme-granted research projects.

The fourth study was published in 2016 by CICP and authored by Pou and co-researchers. The study also covers various aspects of research in Cambodia and offers a lot of information on research trends and patterns in Cambodia. The report uses multiple methods to understand Cambodia's research capacities and takes a more action-oriented approach than the other studies examined. Similar to the second study, the scope of this

particular work is beyond academic institutions. The study uses reasons, opinions and case-based evidence to support its claims.

These four studies have been selected because they are the few pioneering works on the topic of the state of research in Cambodia. Selecting these works therefore did not require critical searching for and filtering out complicated academic literature sets, as is done in the systematic reviews or meta-analyses of well-researched academic topics. Because these studies share both common characteristics and distinctive characteristics, they are good for synthetic, critical and comparative discussions.

These studies are related as they all reflect on the current state of research capacities in Cambodia. Certain aspects are covered by all studies: the trends of research engagement and development, the factors hindering/influencing research engagement and development, and the possible gateways to improving research engagement and development in Cambodia. Most of these studies are policy-oriented. In other words, they are applied not academic works, even though they employ academic approaches and methods. Most are written in the form of a report.

Some distinctive features can also be identified among these studies. The institutional scope of focus of the first and the third study is primarily Cambodian universities, while the second and the last documents tend to discuss research capacities beyond academic institutions. All of the studies other than the second one use multiple methods (for example, surveys, interviews and document analysis) and approach different target subjects (including HEI leaders, policy-makers, faculty members, intellectuals and/or students). The second study has a very specific scope of focus in terms of writing, while the rest are in a more comprehensive report form. Except for the second one, all of these reports are the work of multiple authors. Authorship of the four texts overlaps in certain ways, with the first and the second partially works of CDRI researchers and the second and the fourth studies authored by the same CDRI author. The insights of these two studies, which have the same authors, must therefore be related in some ways. The first and the fourth reports consist of foreign co-authors, which is not the case for the second and the third papers. The appendix at the end of this review offers a clearer explanation of each study in matrix form.

Methods of the Review

In an attempt to ensure that the review is rigorous and avoids bias, this section explains the review's methodological procedures and conceptual focuses.[6] This review is not a single book or article review, nor is it a systematic review or a qualitative meta-analysis of a topic. Rather, this study is a discussion of four documents that have been reviewed together. The method guided this work is in the form of a multiple book review essay. A multiple book review essay *"involves assessing the quality of two or more books that cover the same overall subject area . . . or that are related to each other in a particular way"* (University of Southern California, 2018). However, even though this approach is referred to as a multiple book review essay, it should be clarified that the reviewed texts are not in book format. Three of them are comprehensive research reports and one is an article.

Using this method of review, the current study focuses on the following aspects of each selected study: key themes and topics, critical issues and arguments, the contribution of the author(s) to the knowledge in this area, and the rigorousness of the works (i.e. theory and literature, methods/designs/data and evidence, policy relevance and bias).

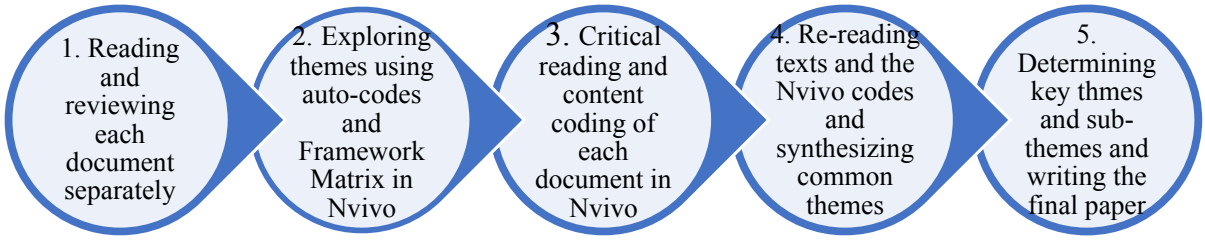

Figure 1. Procedure of the review (Source: Author)

Figure 1 below illustrates the procedure of this multiple document review study. NVivo 12 was used to assist in this whole process, namely in organizing literature files, generating auto-codes, creating a framework matrix and doing actual content coding and annotating to specify key themes, sub-themes and references. The main themes and sub-themes were

[6] It should be noted that this method section is rarely written in detail for general and narrative review works, but the author believes that a detailed explanation of review approaches is necessary for further critiques and the improvement of knowledge in this area.

generated by iteratively reading, coding and contemplating those four studies within the NVivo platform.

In terms of the conceptual focus of this review, two kinds of themes are included: a priori structural themes determined before the act of critical reading and coding, and generated themes from the critical reading and content coding of the reviewed texts. Therefore, the process is both inductive and deductive. The a priori determined themes include, as mentioned earlier, the current state, challenges and ways forward for Cambodian research capacities. These thematic dimensions are the basic and structural conceptual framework of the current review. Further identified themes or sub-themes related or additional to these a priori themes are generated from actual critical content coding. These two types of themes (i.e. prior determined and generated themes) together make up the sub-sections and discussion points of this current review paper.

Unlike some multiple book review essays that use block-style organization, the style of writing the current review is thematic, meaning that all contents of the current review text are based on those synthesized common themes determined and identified throughout the whole review procedure. With all these features of review approaches and the writing style, this particular piece of writing should be seen more as a reflective essay than an original empirical research paper.

In terms of the organization of the writing, the researcher starts by introducing the review in the first and second section, explaining why the research area being reviewed is important, what kind of literature was selected for review and why those works were selected. This section (i.e. methods of the review) explains approaches, procedures and methods of this review and describes the writing organization in order to offer an authentic and critical understanding about the working mechanism. Section 4 synthesizes the key common themes and sub-themes identified in the four documents and discusses the arguments of the works and the evidence used to back up those arguments. Section 5 points to some limitations of the four studies (both acknowledged and unacknowledged by the author(s)). This section also contains a contemplation of what these studies contribute to the knowledge area and identifies what further studies should focus on. The last section – the conclusion section – wraps up the whole review by highlighting some of the review's important points.

Synthesizing and Discussing Key Themes in the Four Studies

The term "research capacities,"[7] which is used in all of these four reviewed studies, is related to various ideas, from research culture-building and research support environment to research engagement and research performance. Drawing from such varied ideas of research capacities, a number of critical themes and points of argument were identified in the four reviewed studies. These correspond to three main questions:

1. *What is the current state of Cambodia's research capacities?*
   - The overall systemic limitations and gaps of Cambodian research capacities; and
   - The transitional momentum of research engagement and research support at some institutions and the national level.
2. *What factors challenge Cambodia's research capacities?*
   - The lack of funding and financial resources that would sustain flows of research-related activities;
   - The systemic problems with academic infrastructure and culture at institutional and national levels;
   - The systemic influences of politics;
   - The concern about individual and collective research competencies; and
   - The question of sociocultural impacts.
3. *What are strategies to further promote Cambodia's research capacities?*
   - Capitalizing and sustaining funding and financial resources;
   - Building and improving academic and research competencies;
   - Systemizing and optimizing academic infrastructures and culture; and
   - Establishing long-term and collaborative research development platforms.

On the Current State of Cambodia's Research Capacities

What the four reviewed studies collectively acknowledge is the systemic

[7] Research capacities can be viewed from different dimensions. For Vessuri and Teichler (2008, 16–17), research capacities constitute such dimensions as capable researchers, time, infrastructure, research climates, funding, structural conditions, research ethics and critical perspectives.

limitations and gaps in Cambodia's research capacities. Like other Cambodian social phenomena, its research entities exist in some form on the surface but lack a resilient and stable foundation. Kwok et al. (2010, p. 9) relate the problem to the issue of quantitative expansion versus the quality of universities and emphasizes the *"lack of research culture and research capacity in many universities*." A clear, undeniable trend is that Cambodian research productivity – i.e. publication and citation – is far below regional and international standards. Consequently, advanced mechanisms that commercialize university research outputs or transform those outputs into economic and social benefits obviously do not exist. The country's research culture is truncated because institutions of higher education are orientated more towards teaching than research. When research resources are limited, research development is generally not strategic and well-coordinated. The findings from all these reviewed studies, therefore, imply that research capacities at Cambodian universities – whether the research culture, research support structure or research performance – are limited and face challenges at all levels, from individual and institutional to social and national levels.

But, rather than calling this phenomenon a "systemic failure," these studies seemingly see transitional substances and momentum in Cambodian research engagement and capacity development, with evidence of positive cases and trends emerging. In other words, in this context of systemic gaps and limitations, Cambodia has been able to improve its research capacities in certain ways in the last few decades. Some of these trends and patterns (discussed below) include the existence of donor-driven consultancy research works, increased awareness and acknowledgement of the value of research, and increased piecemeal research promotion initiatives at institutional levels, with support from the national level. This transition implies the existence of some clusters of excellence in this country. However, those improving trends and patterns also receive critiques, which are also discussed below.

Existence of Donor-driven Research Work

One clear tendency concerning Cambodia's research capacities is that most research works are in the form of donor-funded, commissioned or consultancy projects. Two of the reviewed studies highlight this clearly:

> *With the near absence of state funding for university research, Cambodian researchers based in universities have been involved as collaborators or consultants in projects funded by*

> *donors, aid agencies, international non-governmental organisations, and foreign universities* (Kwok et al., 2010, p. 11).
>
> *Some academics at a few public universities are relatively active in research through projects commissioned by donors and overseas university partners or through consultancy projects* (MoEYS & The World Bank, 2015, p. 12).

These donor-supported trends are more obvious in non-academic and non-governmental sectors in Cambodia, which can be viewed as a positive contribution from the donor side to research development in the country. Eng (2014, p. 4) describes this as follows:

> *In fact, outside of the state institutions and public universities, critical and independent research is being conducted by Cambodians . . . . This is made possible through support and resources from international donors. Indeed, international donors have played very important and influential roles in setting research priorities, building research capacity, and mobilising the policy recommendations and actions arising from research findings.*

While such commissioned and consultancy works can be seen as something that fuels the research engine in the short run, researchers may question the long-term impacts, especially in terms of building (academic) research capacities in the country. Previous researchers have already cautioned that donor-driven research is not a sustainable model in the long run.[8] In some donor-funded projects and consultancy work, researchers may engage in the whole research process from start to finish, but in others, they are only commissioned to do certain tasks such as data collection or report writing. Pou et al. (2016) note that most of those projects are short term and require collaboration with foreign experts to operate. Collaboration with foreign experts is fine but dependence on them is not. Research priorities, for example, should be determined by capable local thinkers and practitioners who can master the contextual reality and have clear insights and visions for their areas of expertise in Cambodia. In that regards, Eng (2015) claims that local researchers have more contextual knowledge (with the advantage of local language) and can better communicate with local participants and interpret the given information.

The research outputs from consultancy works can be another concern in the long run. Most of the outputs are in the form of research

[8] See Eng (2014) for discussions on such arguments in the literature.

reports. These research outputs are generally not academically peer reviewed and so may not reach the quality expected by international academic journals, raising the question of the validity of the research. Such issues again point to the question of the long-term impact on academic research and academic culture at Cambodia's academic institutions. The problem of quality could be exacerbated if local researchers just engage in those projects in the expectation of financial incentives and not for increased research competencies or long-term academic credentials. It should also be noted that the root of research culture and practices at universities is academic research. Cambodian universities tend to engage in research in the opposite direction from other universities, starting from commissioned and mostly applied kinds of research before having a strong academic research foundation in place.

Increased Awareness and Acknowledgement of the Value of Research

The claim that there is an increased awareness and acknowledgement of the value of research by Cambodian academics and other stakeholders is agreed on by most of these reviewed studies. But, like the issue of donors-driven research, there are points to be critical of such claims.

The perception of the DIG projects' sub-managers is clear evidence that supports the idea of increased awareness and acknowledgement of the value of research in Cambodia's higher education sector. That study by MoEYS and The World Bank (2015) claims:

> *The subproject managers and HEI leaders interviewed valued the experience and learning from their participation in the scheme, and . . . they are becoming more aware and engaged in promoting research activities within the participating HEIs* (p. 42).

MoEYS and the World Bank (2015) also reported that sub-project managers are positive about the future sustainability of research culture promotion at Cambodian universities. In the same vein, Pou et al. (2016, p.7) mention "research-hungry instructors" and cite research-interested students to argue against the common view that the interest in research of Cambodian students and faculty members is very low. They write:

> *Cambodian ministers and administrators are accustomed to an environment where research is undervalued, capacity is low, and privileged students are not interested in doing work. However, what we found on the ground is a group of vibrant and very interested students and researchers, and in some cases innovative department heads and rectors who are attempting to forge a space*

> *where research that is already valued can be conducted with integrity* (p. 4).

This argument by Pou et al. (2016) may be overexaggerated if it intends to make generalizations beyond those cases in its study without further evidence to support its claims. There is a general pattern that seemingly contradicts this claim. Many undergraduate students at Cambodian universities, for example, when asked to choose whether to take examinations or to conduct research to graduate, choose the former. This is one reason for the common view that students are not interested in complicated, time-consuming research tasks. One critical question to also ponder is whether it is true that the majority of Cambodian academics stop seeing academic research as just students' research (as denoted by Kwok et al. (2010)) or whether they recognize the importance of academic research beyond something that generates income and/or reputation (MoEYS & The World Bank, 2015). One can easily talk about value of research; however, measuring its magnitude is hard. Generally, experiential understanding of those values may not happen for students or faculty members who have never deeply understood or experienced research themselves, especially academic and scientific research.

National and Institutional Contributions to Research Promotion

Despite the limitations and critiques of the research capacities in Cambodia in general, most of the reviewed studies positively acknowledge support and interventions for research development at national and institutional levels (Kwok et al., 2010; Eng, 2014; MoEYS & The World Bank, 2015; Pou et al., 2016). MoEYS and the Directorate General of Higher Education (DGHE) have contributed significantly through policy direction and by providing guidance and practical support for research development at universities, as evidenced by the issuance of research policy in the education sector, the development of a research masterplan and the coordination of the HEQCIP and DIG schemes. The study by MoEYS and the World Bank (2015) notes that participants who are sub-project managers and HEI leaders see the DIG scheme as a breakthrough support for Cambodian universities from the national level, especially in terms of research funding and training and the future career of faculty members.

At the institutional level, some universities have been active in research promotion. Kwok et al. (2010) and MoEYS and the World Bank (2015) specifically note some of those universities, including the Royal University of Phnom Penh (RUPP), the Institute of Technology of

Cambodia (ITC), the University of Health Science (UHS), the Royal University of Fine Arts (RUFA), the National University of Management (NUM) and the Royal University of Agriculture (RUA). Some of their key strategies include making available an internal financial package for research; creating appropriate researcher positions (as in the case of ITC); creating some forms of internal body to link to industry, partners and/or donors (also in the case of ITC); and sending faculty members overseas to pursue higher degrees and retaining them to serve the institution when they return. The increase in number of PhD holders from abroad into the local academic system is another appreciable transition at the institutional level that influences Cambodian research capacities, although retaining them in the system and engaging them in deep and sustainable research works can be a challenge (Kwok et al., 2010; MoEYS & The World Bank, 2015).

Outside of but related to the academic sector, the reviewed studies also highlight models of research capacity development. Kwok et al. (2010) point to the model of the Development Research Forum (DRF), whereby researchers from CDRI and its partner institutions take the lead in organization. Pou et al. (2016) also highlight the research capacity-building training along the implementation of the research project as a good model for building the research capacity of Cambodian researchers and students. The research training offered to universities along with the DIG schemes is obviously another model to promote research capacity. It should be noted that these endeavors are generally collaborative efforts.

However, these achievements and endeavors remain piecemeal and fragile overall. Policy, masterplans and periodic program interventions from the national level are not seen as sustainable mechanisms, generally because actions stop when support interventions and funding are completed. Institutional research promotional practices initiated by the institutions are still very limited and impractical in many aspects. For example, teaching-oriented faculty members still see income from teaching more easily earned and more satisfactory in amount than the financial incentives they can get from internally available funding packages. So, they still are not motivated to engage in research. Some of those institutional strategies are stuck at the "wishful thinking" stage and are never realized in actual practice. External mechanisms in the forms of research development forums are still new endeavors and they have not yet contributed systematically to larger beneficiaries, especially those in the academic sector. These external platforms also finish when the funding is finished. To understand these challenges in Cambodia, it is necessary to

explore the specific challenges hindering research performance and development identified in the four reviewed studies.

The Key Challenges of Research Capacity in Cambodia

The above contextual discussion on Cambodian research capacities may provide some insights into why the situation is as it is today. But, none of the specific challenges alone (for example, finance, competence, resources or time) and the specific level (such as individual, institutional or national) can fully explain the challenges facing Cambodia's research capacities. Taking a macro view, one can see the problems of Cambodia's research capacities – like many of its other social problems – as a combination of the direct and conditioned effects of different factors at different levels. The influencing factors are ecological and systemic as well as specific and context based.

From the four reviewed studies, four key challenges can be identified: financial constraints, institutional academic infrastructure and culture, political influences, and individual and collective competences. These are epistemically and pragmatically justifiable in many ways and together create an ecosystem of challenges facing any kinds of research promotion dimensions in Cambodia, whether it is research capacity and culture building, research resource-creating, institutionalizing research or commercializing research. Each of these issues is discussed below.

Funding and financial issues

A chronic lack of funding is considered a major challenge to Cambodian research capacities. The problem of funding in Cambodia can have various meanings, including a lack of government funding, a lack of incentives for researchers, inadequate academic salaries and undiversified income-generating sources for university. These gaps in funding further influence the conditions of other resources necessary to support research at the institutional level – resources such as materials for experimentation, laboratories, data analysis software, subscription to journal outlets and travel costs for researchers. Therefore, the capability of universities and related stakeholders to generate funding, to capitalize and sustain those financial resources and to efficiently utilize them is a critical issue. In developed countries, funding from government and industrial sectors for university research is generally adequate and grant opportunities are also available. Certain world-class universities can even compound their research capitals through commercializing and vending their research outputs. Cambodia, however, lacks funding from both the government and

the industrial sources. MoEYS and the World Bank (2015) put it:

> *Although the Royal Government of Cambodia provides financial support for basic operation of public HEIs, there is no governmental funding for research in higher education* (p. 11).
>
> *This lack of adequate public resources allocation and investment for HEIs and the education sector more broadly over the last three decades has significant implication on the ability of HEIs to attract and retain qualified staff, to implement on-going capacity improvement program of its staff, to conduct scholarly activities including research and scholarly publication, and to improve the quality standards of school graduates* (p. 18).

The increase in funding and financial support in the last decades are appreciable but still inadequate. For example, the HEQCIP program, which had US $23 million of funding in total, was initiated and implemented between 2010 to 2015. Such support interventions and unstable funding packages are still very small compared to the investment in research of other countries in the region and are not structured in a way that sustains decent research works at Cambodian universities in the long run.

While public universities face a shortage of supporting funds and financial resources, Cambodian private universities are also in a similar situation. Private universities in Cambodia are generally for-profit institutions that focus on training and teaching in order to generate income. Their income source is primarily student tuition fees. Large additional income sources with which to conduct expensive research projects do not exist at private universities.

Whether researchers see funding and financial issues as a key factor inhibiting research works or not, they tend to collectively acknowledge that the lack of funding and financial support is an undeniable truth in the Cambodian context and that the problem has to be solved. Various participants in the reviewed studies even implied in their words that providing financial support (i.e. incentives) to individual researchers has to be at an optimum level for research capacity-building to succeed; in other words, it has to be close to or higher than income from teaching or at least high enough to secure a decent life for the researcher in order to attract competent researchers to focus on research or to encourage teaching faculty members to engage more in research.

Research Competencies[9]

Funding is obviously a problem affecting Cambodia's research capabilities, but seeing it as the main and only cause would be an inaccurate perception. In fact, there have been many debates on whether it is funding or individual competencies that is the root cause of the low research engagement in Cambodia. Lessons from the DIG scheme (examined in the study by MoEYS and the World Bank (2015)) show clearly that the existence of funding does not guarantee research outputs and performance. A lack of experience with research management, a lack of an academic stock of knowledge with which to generate research ideas and dependence on external advisors to manage the technical aspects of research are some competencies-related issues identified in the report on the DIG scheme as barriers for quality research performance. MoEYS and the World Bank (2015, p. 60) report:

> *There was a mismatch between DIG's expectations and the research capacity of Cambodian academics. . . . It has been confirmed by our key informants that the majority of the subproject proposals – even many of the successful ones – were of less than satisfactory quality and majority of them appeared in the form of development project rather than research proposal.*

DIG grant recipients generally need rigorous and advanced training, internal advisors, key resource persons and/or donor research advisors to help them. Of the total 45 projects granted under the DIG scheme, MoEYS and the World Bank (2015, p. 43) reported that: *"Only a few of the subprojects (are likely to) produce results that will be accepted for peer-reviewed journal publications."* The fact that three of the four reviewed studies recommend research capacity-building and training platforms to promote research capacities implies that improving the research competencies of individual faculty members is needed to ensure research performance and culture at Cambodian universities.

In fact, individuals with competencies and commitment are the ones who have generated research outputs at Cambodian universities so far. However, the four reviewed studies seem to agree that Cambodia still lacks a critical mass of those experienced and research-qualified faculty members to systemically boost research outputs with quality at a faster

[9] Most of the studies reviewed used the term "individual research capacities" to refer to research competencies.

speed. Such a lack of researchers implies that funding is important but not the sole factor that leads to efficient research performance. As Pou et al. (2016, p. 7) put it:

> *The lack of funds for research activities was a consistent theme in our interviews. However, even when there are funds available, often research projects do not get executed.*

To be an effective researcher – more specifically, an effective academic researcher – one generally needs strong holistic and practical experience in research through their graduate and/or postgraduate years. Exposure to and mastery of academic background knowledge in a certain research area, experience with general and area-specific research methodologies and methods, competencies and experience to manage and lead projects and build networks, and competencies in publication and the dissemination of research outputs are all needed to function properly as a researcher. This is not to mention the other supporting skills and literacies required, such as English, communication and information-handling skills. Faculty members without such experience and skills will be overwhelmed with research works no matter how much they want to do research or truly value research. In fact, research competencies may be closely linked to how one understands research and therefore how they are committed to research or value it. In discussing the nature of science (NOS), McCain (2016, p. 4) asserts that: *"without a proper understanding of NOS one cannot truly understand the process of science, make well-informed decisions about socio-scientific issues, or fully appreciate the importance science has in our contemporary culture."* This is not to say that true academics and scientists with such level of competencies in Cambodia do not exist, but, again, they are very limited in number. Additionally, some leave academia for other fields.

Academic and Research Infrastructure and Culture

The lack of a strong academic and research infrastructure and culture is another huge concern for Cambodia. Cambodian infrastructure and the culture of academia and research are not just a factor at the institutional level but an issue for the whole system of higher education of the nation, and, when it comes to this factor, there are many deep-rooted issues involved.

Academic and research culture includes various key ideas, such as the idea of collegiality and academic community; the collective understanding of the nature of science and scientific ethics; a sense of

academic identity; academic career paths; an academic governance system that values academic freedom; the scientific root that shapes many aspects of academic disciplinary research; an academic peer-review system and the nature of academic pursuance of knowledge and truth. These issues are obviously a big concern for the nation at large since Cambodian HEIs, which were re-established after the downfall of the Khmer Rouge regime, are perhaps not based on such foundations in the first place. MoEYS and the World Bank (2015) state:

> *One critical aspect of a research culture in higher education is the existence of an academic community where academics come together to share and exchange ideas. It has already been noted that such a community is absent in Cambodia* (p. 51).
>
> *Cambodian universities, especially the public universities, lack a well-defined system of professional ranks and career tracks in which promotions and salary increases are mapped out for academic staff. This is a most glaring systemic weakness which cannot be solely addressed from within a university; it has to be addressed at a national level and from a national perspective* (Kwok et al., 2010, p. 10).

Aside from the academic culture, institutional academic and research infrastructure (in this review referring to the physical research supporting structure) is lacking. This includes research laboratories; research-based graduate schools; subscription to academic sources (e.g., academic journals, databases and indexing platforms); research offices that deal with research financial management and liaise with external stakeholders and research technical support offices (that may handle technical aspects of research and research methodologies). This is not to mention advanced research commercialization facilities (such as an office for technology transfers or an office dealing with patents) or the idea of a science park. Specialized and advanced centers of excellence in certain important fields also do not exist at Cambodian universities. Of course, some developing countries have functional research systems without the need to possess all these advanced infrastructural entities. However, for Cambodia, these facilities simply do not exist even at an optimum or necessary level. Some previous initiatives lead to the establishment of the so-called "research office" at Cambodian universities, but these offices generally do not offer much support to faculty members who do or want to do deep research and they are not in any sense close to the general idea of research centers.

Many justifications can be used to explain this lack of academic and research infrastructure and culture in Cambodia, from the idea of "missing generations" (as discussed by Kwok et al. (2010)) and the influences from French and Russian higher education models (as pointed out in MoEYS and the World Bank (2015)) to the lack of a tradition of research-based graduate programs that create researchers from younger ages.

In addition to these academic system issues, the current dominant teaching-oriented system of Cambodian higher education adds more difficulties to any attempts to create a strong research infrastructure and culture. Because the wages or salaries of university faculty members are based on the number of teaching hours, most academics tend to do a lot of teaching; and because universities' income source is dependent on students' tuition fees, as earlier mentioned, students are one of the most important stakeholders in evaluating teachers' quality. Therefore, so long as teachers can satisfy their students and help students learn well, research is not that important to university staff. The teaching-oriented system raises the question of what time is available for research. Kwok et al. (2010) put it:

> *Salaries remain low, especially at public HEIs. Lecturers tend to take up part-time teaching at a number of other institutions. Without being able to earn adequate incomes with a normal teaching load, lecturers are chained to the teaching treadmill, and there is literally no time left for research* (p. 10).

Research is time-consuming, especially for young researchers and those who have not gone through rigorous research-based doctoral programs. These groups cannot just do research right away: they have to learn how to do research through the process of doing it. Therefore, they need time. These issues of teaching-oriented system and time are part of a picture showing why the practical academic context in Cambodia does not match the expected academic roles of its faculty members in a theoretical sense. Many faculty members see this as a contextual reality that is hard to change.

MoEYS and the World Bank (2015, p. 21) consider employment practices at Cambodian universities *"to be also critical to shaping the experiences and expectations of the academic life in Cambodia."* In theory, academic institutions should have performance-based approaches for recruitment, motivation and promotion. Any inappropriate or unfair practices of these tasks – i.e. that are not based on academic principles –

can easily complicate the whole system. In simple language, if promotion is not based on quality research outputs, the motivation to engage in research can be low. At Cambodian universities, these employment practices (recruitment, promotion, etc.) have not been based much on the quality research works or knowledge contributions of faculty members into their academic areas.

One can consider all these gaps related to academic and research infrastructure and culture as the lack of an ecosystem of research in Cambodia in general. The research ecosystem can extend beyond those earlier mentioned problems and cover things such as the lack of intellectual property rights implementation, the lack of a unified national patent office and the lack of research traditions since early education levels. Again, this is not just a problem at the institutional level but obviously at the national level.

The Issue of Politics

Related to the issues of academic and research culture and infrastructure is the influence of politics on Cambodian public institutions in general and universities in particular. Among the four reviewed studies, Eng (2014) makes the strongest arguments on this particular issue. Her study claims clearly that politics is the core factor that influences Cambodian research capacities, arguing that while it is not the only factor, it is the most important one. The author further contends that the systemic influences of politics also condition the other factors affecting engagement of Cambodian researchers. Eng (2014) writes:

> *In Cambodia, while "lack of resources", "lack of institutional support" and "lack of infrastructure" may be seen as technical and institutional issues, access to resources, facilities, infrastructure, and institutional arrangements conducive to research career and capacity development are all the result of political decisions about who gets what, when and how* (p. 4).

This is an argument that Pou et al. (2016) and the other two reviewed studies also acknowledge in certain ways. Pou et al. (2016) mention the political impacts that cause a lack of collaboration from target institutions during data collection, seeing the situation as an inhibiting factor that distracts some from doing research. Previous local studies on the idea of accountability in Cambodia generally argue that the patrimonial culture and the patron–client system keep Cambodian public institutions as political institutions. For example, Chet (2009) claims that there are cases

where universities' leading members have been appointed for political reasons (as cited in Eng (2014)).

Politics can influence individuals. Expecting lucrative benefits, improved status and less challenging workloads, some potential academics have already stepped into positions that serve a political agenda (Eng, 2014). This is reflected by the idea of a "brain drain" of Cambodian academics raised by Kwok et al. (2010, p. 38). Because of these political influences, research results may be given less serious attention by stakeholders and by the government, a situation that further leads to the question of the values and feasibility of critical research in Cambodia.

In contrast to this argument, some critiques claim that politics is not necessarily the root cause of not doing research. Researchers can study many topics and areas which are not necessarily political in nature. Some critiques even further claim that such accusations about politics are just an excuse for not doing research. Cases where there have been increases in the collective research outputs of countries which are known for their government's influential political agenda on the state system, such as China, show that the research performance of academics (particularly in the fields of natural or physical science) may not be influenced by politics. Of course, this may depend on what disciplines of research being talked about. However, the point the authors of the reviewed studies make is not that politics affects the topics or disciplines of research but that it can influence the allocation of resources, support systems and decision-making that affect research engagement overall.

Sociocultural Factors

Sociocultural factors – which are distinguished from the earlier mentioned academic culture – generally refer to the overarching thought or belief systems of a society that shape individuals' ways of thinking, attitudes and behaviors. While these factors are raised and discussed in the reviewed studies (mostly indirectly), the studies minimize this argument and/or do not consider this a main factor influencing research engagement in Cambodia.

In fact, previous literature has claimed that a lack of reading culture, traditional teaching practices and a poor attitude towards asking critical questions and making inquiries are inherited cultures in some Asian countries that do not allow a strong research culture to sprout and grow well. Students in such contexts are believed to be taught to remember and follow advice rather than to think critically and creatively. But Kwok et al.

(2010) and Eng (2015) caution that this argument can be false because some Asian nations with similar social and educational cultures to Cambodia have already shown progress in research. Therefore, these studies argue that such sociocultural factors may not be a key problem for Cambodia.

Conversely, Pou et al. (2014) highlight the issue of possible conflict-provoking discussions when Cambodian researchers work together and so point to the issue of trust in research collaboration. This argument, which is different to the point that Kwok et al. (2010) and Eng (2015) discuss above, reflects part of the dominant sociocultural attitudes of a society. Such attitudes are obviously not friendly to research and academic culture in general. It should be noted that academic discussions point to ideas, not people, and are based on truth and evidence rather than emotion or subjective opinions. Academic and scientific attitude is about openness and progressive learning and the acceptance of disagreement. It is about critical, insightful discussions, not blind consensus. People lacking exposure to scientific research and academic community norms may find it hard to embrace such attitudes and the inability for them to work together and to accept criticism is very likely. Pou et al. (2016) further emphasizes that this inability to connect and understand each other based on trust and tolerance is one of the core factors inhibiting research in Cambodia.

It is hard to make any specific claims about the abstract concept of sociocultural factors with the data available now. However, academic studies should consider using the framework of social psychology or sociology to explore this issue in relation to research capacity in Cambodia. Some questions that could be explored are how much Cambodians are committed to truth and knowledge and how tolerant and open Cambodians are to criticism. The truth-loving attitude and open mindset are closely related to scientific and academic philosophies and approaches. If society does not embrace this mindset, the promotion of scientific research will face many challenges. Therefore, without studying these factors critically, claiming that sociocultural factors do not have any influence on Cambodian research and academic capacities by reflecting only on trends or literature existing in other contexts may be misleading.

On Ways Forward in Developing Research Capacities in Cambodia

By identifying the factors and understanding the contexts of Cambodia's research capacities, the four reviewed studies came up with four major domains of recommendation: creating and capitalizing funding and financial resources; building and improving academic and research competencies; systemizing academic and research infrastructures and culture; and establishing long-term and collaborative research development platforms. These can be either systemic or programmatic interventions. All of these recommendations are directed to the different stakeholders who play different but collaborative roles in promoting Cambodian research culture and performance. These recommendations are not just about research culture development but the promotion of the whole academic and higher education system of the country in general.

Creating and Capitalizing Funding and Financial Resources

Systemic support in terms of funding and financial resources from the government is one of the major recommendations made directly or indirectly by all four studies. Calls for government funding are important because not many countries around the world have a strong academic research culture and performance without large-scale funding support from the government. The government also has to make sure that the funding provision is merit-based. In addition to getting funding from the government, these reviewed studies encourage universities to connect with industry, partners and donors for more support. Institutions like ITC are examples of successful cases of such practice in Cambodia. This entrepreneurial approach allows universities to diversify and enrich institutional research funding sources. Internal funding schemes, which are an existing practice at certain Cambodian public universities such as NUM, RUPP and ITC, is another strategy for promoting research engagement from within. However, this strategy seems to not work well because the support does not reach the optimum level (i.e. higher than or equal to income from teaching) for most faculty members. The capability of Cambodian universities to avail, diversify and sustain funding for research is necessary to ensure research engagement in the long run. And there is no way for universities to do this besides becoming more entrepreneurial.

Research financial resources should consider the idea of incentives, which is a popular term in Cambodia. Given the fact that research is a hard, time-consuming task, low financial incentives may not change the attitudes

of teaching-oriented faculty members, remembering that teaching is the primary role of Cambodian faculty members because more teaching means more income. Using the word "profit" may be even more fitting than "incentive" in the Cambodian context because evidence from the DIG scheme evaluation shows that academics expect the research incentive package to be higher (i.e. more profitable) than incentives from other activities. Voluntary work with low incentives or without profits are seen as just an additional workload that nobody wants to do. Placing financial incentives first in order to do research is practical, if not pragmatic, for many in Cambodia. So, proper support in terms of both systemic funding and financial incentives is considered necessary to kickstart research engagement in Cambodia.

Building and Improving Academic and Research Competencies

Improving the academic and research competencies of faculty members individually and collectively as a team is necessary in order to build and improve academic and research capacities and productivity. Faculty members without a PhD need some quality research training as well as other professional development mechanisms to ensure their lifelong learning in the academic pathway. Research training is offered by the HEQCIP project but is considered too general, and so more advanced training courses are required. Exposing faculty members to international conferences or working with international researchers to author papers is also recommended. However, the practice of using external advisors to support local faculty members to complete their research tasks, although necessary for the implementation of DIG scheme, is no longer suggested. There are also suggestions that NGOs or civil society institutions with strong research capacities should contribute to capacity-building training for students either directly or through internship programs and to engage more faculty members from universities in their research activities.

What, then, are the key competencies required to be a researcher? While many different research competencies can be identified, four dimensions in particular are crucial: mastery of academic background knowledge in the research areas of a certain field or discipline; mastery of the philosophical, procedural and technical aspects of research methods in a certain field or discipline; competencies in research management and leadership skills (from planning and managing projects to leading and communicating with stakeholders); and mastery of research production skills (such as writing and publishing in academic journals, understanding the peer review system and presenting papers at academic conferences).

Any specific courses in research training – such as research grant proposal development, English academic writing, how to publish in an academic journal, using statistical software and using referencing software – fall into these major dimensions of competencies. Whether it is through training or through other kinds of programs, none of these major competency dimensions should be ignored.

Training for research support teams – dealing with logistic and procurement issues, for example – is also necessary for Cambodian universities, as illustrated in the study by MoEYS and the World Bank (2015). It should be noted that competencies among Cambodian faculty members and research support staff in terms of research implementation vary; therefore, different groups may need different kinds or levels of training or support. For example, some academics with extensive and long-term experience in research may find training unnecessary for them, while newer and less experienced researchers may need a lot of training. Designers of research capacity-building training or programs should keep this gap in mind.

Systemizing Academic Infrastructure and Enhancing Academic Culture

Another important macro-level recommendation from the reviewed studies was to systemize academic infrastructure and enhance academic culture. A strong academic career system is one of the most important elements to have to ensure a strong academic culture. Most of the reviewed studies identify academic rankings or professorships and academic salary scales as elements that need to be put in place and re-appropriated. The Cambodian system of higher education – which was damaged by prolonged wars, influenced by different higher education models and fragmented by piecemeal and poorly planned development interventions – needs to seriously rethink its academic system. Academic recruitment, workloads, evaluation and promotion are various factors that also need be re-organized or clarified so that Cambodian faculty members can have a favorable working environment. The procedures to implement these aspects has to be merit based, transparent, peer assessed and excellence oriented. Political reasons should not be related to these implementations.

In addition to this, the teaching-oriented and teaching-hours-based income systems currently in place in Cambodian universities need to be reconsidered and re-appropriated. Recruiting more full-time faculty members and giving them an adequate salary package may be an option to avoid them teaching too many hours and encouraging them to focus more

on research and other academic works. To put such recommendations in place in the macro-system requires the strong and sincere wills of leaders and policy-makers and, of course, collaborations among stakeholders.

There are still many other systemic and macro-level questions remaining unanswered for Cambodian academic and higher education systems. For example, one should question whether all universities in Cambodia should engage in academic research, considering their current practices. One should also question whether a clear typology and ranking system for universities should be established for the Cambodian higher education system. These and other questions may be easier to answer when proper and clear academic works and careers are in place.

Establishing Long-term and Collaborative Research Development Platforms

Although a lot of recommendations discussed so far focus on systemic changes and improvements, the authors of the four studies tend to believe that programmatic interventions are still a working approach for Cambodia. One common suggestion among the reviewed studies is that long-term and collaborative research development platforms are needed. These programmatic platforms will in the long run accumulate research resources for the country. Such interventions should be long term because there have been unsustainable and low impacts from short-term programmatic interventions in Cambodia in the past. The authors also believe that without multiple stakeholder engagement, the implementations will face problems and the expected impacts will not be paramount.

Three of the four studies mention development and training platforms and activities which can be learnt from and/or innovated further. Kwok et al. (2010), for example, focused on DRF (organized by CDRI and partner institutions). MoEYS and the World Bank (2015) discussed the HEQCIP and DIG schemes. Pou et al. (2016) mentioned the research-and-training combined activities (i.e. the action research component in their study). These models are research development models that these studies argue are very practical for the Cambodian context. However, none of these models can transform the Cambodian research culture and system to an optimum place if key systemic clarifications and re-appropriation do not occur, as discussed earlier. Academic and research institutions themselves are the key driving factors that determine the success of any programmatic or systemic promotion models.

Significance and Limitations of the Four Studies

These four studies can be considered pioneering works that introduce the topic of research capacities in Cambodia. They offer descriptive facts and opinions on the topic. Further attempts to investigate the states of research in Cambodia should embrace insights from these four studies. As a researcher of this particular issue myself, I have learned a great deal of factual information from these studies and can relate to the practical arguments the authors try to make. Policy-makers and practitioners may find these texts useful in many ways.

Information about the existence of research at certain well-known institutions in Cambodia in the first study (Kwok et al., 2010) offers direction for more critical research and case studies. Findings in the study on the DIG scheme (MoEYS and the World Bank, 2015) is also very important for future practices of MoEYS, the Directorate General of Higher Education (DGHE) and relevant institutions in promoting research endeavors at Cambodian higher education institutions. Some key arguments on systemic political influences in academia in Eng (2014) are sound and critical. It is, however, hard to measure how much this factor is a root cause and further investigation is required. In the study by Pou et al. (2016), the innovative approach that includes capacity-building training along the way of research can be appreciated, but how this model can really create researchers in Cambodia and sustain their engagement in research after the training ends also has to be explored.

Most of these studies offer lots of practical recommendations for stakeholders; however, the recommendations of some studies can be too many in number for policy-makers to consider, and it is debatable whether some of the recommendations are actually good and strategic in the context of limited resources.

Other Possible Areas for Further Studies

Despite many positive contributions to the research area, a few limitations related to thematic scopes of the reviewed studies should be highlighted.

The discussion of the factors that influence research engagement in the four studies does not explore in-depth academic leadership and management at the institutional level. Kwok et al. (2010) considers academic governance and leadership an important issue in some ways. The leadership and management dimensions of research can be interesting to explore because the issues of politics, academic infrastructure, resources

and finance can be strongly influenced by who the leaders and managers of the institutions are. The patron-client nature of Cambodian culture and institutions makes its leaders or bosses very powerful, and these leaders' academic qualification, experience and knowledge can determine the future of research performance at their institution. Such leadership roles are important, at least in the transitional period of research development in Cambodia. Some Cambodian key leaders and actors in higher education institutions have been identified as "game changers" who can self-reliantly contribute to reconstructing the fragmented academic, scientific and research cultures from within their institutions while entrepreneurially embracing external support schemes in a proper manner. These leaders may be engaged in politics but if they are academically competent and entrepreneurial, they can still find ways to raise research outputs and foster research cultures, even under the shadow of political agenda.

Such claims are not without evidence. The example of some key leaders, as in the case of ITC's rector and its research unit director and the case of leaders of RUPP and RUA, are evidence of how leadership plays a role in moving up research. Other cases – such as CDRI's director and CSK's director – may be interesting to study as well, even though they are theoretically non-academic institutions. Rather than blaming the context, these leaders innovatively and entrepreneurially work out ways to ensure some research engagement at their institutions. To do so, they have had to overcome deeply ingrained attitudes against research endeavors. It should be noted that little has been studied about leadership at public non-university research institutions, such as SNEC and CARDI, as well.

Also, none of these studies focus on measuring the research outputs and productivity of Cambodian researchers. These baseline statistics are very important in order to understand in an accurate way the real trends of research performance in Cambodia. Empirical studies using scientometrics or bibliometrics frameworks and instruments may be hard to conduct in the current Cambodian context because most Cambodian researchers who publish do it while they are working or studying outside the country. Local publications are generally not at the level indexed by international databases such as Scopus or Web of Science. So, a proper baseline survey with critical design may offer some good databases for future studies.

It should also be noted that none of these reviewed studies discuss or explore the market research or industrial research and development that are conducted in the business and industrial sectors. This is understandable because such research works may not exist abundantly in Cambodia and

because these authors have backgrounds in civil society or the academic sector. However, the industrial and business research dimension in Cambodia is worth exploring and understanding. In natural and physical science especially, funding and financial support from the industrial and business sectors are necessary to strengthen existing research.

The Frame and Depth of Argument of the Four Studies

Another limitation is the frame and depth of argument in some of the studies reviewed. Factors discussed in the studies are generally multidimensional and descriptive but not strategically critical and focused. It is perhaps more pragmatic for policy research to dig down to the root causes and figure out the main factors influencing research capacities in Cambodia. Only such in-depth studies can really point to clear strategic policy interventions. Eng (2014) tries to do this by focusing only on the political dimension and her arguments are logical and deep in many ways. Further studies should follow this focused approach and clearly specify certain factors influencing research capacities in Cambodia in order to understand them fully and deeply and to generate ideas of guaranteed interventions to solve those specific problems.

Discussions on the factors that influence research capacities without clearly distinguishing between those in the field of science and those in the field of social science and humanities is another gap to consider for further studies. The assumed generality for all research disciplines may make some arguments raised by the reviewed studies invalid. For example, research is more costly in terms of investment in the fields of natural and physical sciences than in the humanities or social science. The term "research" in these reviewed studies is too broad. They cover research in general, without focusing specifically on academic research, policy research by civil society and NGOs, practice-oriented research at the institutional level, or industrial research and development works. Pou et al. (2016) and Eng (2014), however, do focus mostly on social research. Again, a clear frame will allow discussions to be focused and in-depth.

In an academic sense, some claims made in the reviewed studies are stated without any serious evidence provided in support. Most studies claim to use a mixed-methods approach, but there is little description or evidence on how they really integrate qualitative and quantitative analyses. From the perspective of advanced mixed-methods, the lack of deep integrative aspects between the quantitative and qualitative data is a weakness of design.

Conclusion

Cambodia and its universities require robust capacities of research and science to ensure further development and, in the long run, to catch up intellectually, economically, politically and socially with other developed nations. The four reviewed studies in this current work, with their main focuses on research capacities of Cambodia, collectively reveal systemic patterns of gaps and limitations that need to be alleviated. These studies are pioneering works that introduce and elaborate on this critical topic in Cambodia.

All four studies note that some piecemeal cases of good practices exist at certain universities and institutions (such as ITC, RUPP, RUA and CDRI) and that some interventions (such as DRF, HEQCIP and some universities' internal strategies) have been implemented. With such observed facts, these studies conclude that Cambodian research is in transition in its performance and development.

The main issues and challenges identified are a lack of mechanisms to capitalize and utilize research funds and financial resources, fragmented academic careers, infrastructure and culture at institutional and national levels, systemic political influences, and individual and collective research competencies. With these identified issues, the studies offer some recommendations that are based on the big idea of long-term and collaborative research capacities development platforms, secured systems of funding and financial resources, and clarified academic culture and systems. Some intervention models (such as the DRF) and comments on national academic systems (such as on establishing academic rankings and improving academic salaries) are specifically proposed by these studies.

While all of these studies are notable for their practical knowledge and big-picture understanding, more critical and analytical studies that focus on specific key factors (raised but not discussed deeply by these studies) should be conducted. The roles of university leadership and management – which have activated research functions at the institutional level so far in the Cambodian context despite all the systemic problems – should be critically explored. These exceptional leaders, with capable researchers and research supporters, have important roles to play in creating resources, building competencies and establishing a workable institutional system of research in Cambodia. Also, because research performance is internationally measured by publications, citations and other bibliometric/scientometric indicators, a large-scale baseline survey

of Cambodian faculty members' research outputs should be initiated and implemented. The lack of that empirical dataset makes it hard to engage in serious analytical and predictive research studies on this important topic. An increased focus on research in the business and industrial sectors may also shed new lights for research capacity development in Cambodia. All of these themes are worth exploring in further studies.

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Appendix: Matric Summary of the Four Studies[10]

	Kwok et al. (2010)	**Eng (2014)**	**MoEYS and the World Bank (2015)**	**Pou et al. (2016)**
Type of document	Special report (i.e. written basically as a research report)	Article (i.e. written in an opinion essay style)	Stocking report (i.e. written as a program evaluation report)	Project report (i.e. written as a report for donor)
Scope of study's contents	- Comprehensive coverage on states of research capacities of universities - An exploratory study - Unspecified disciplines of research	- Specific focus on political influence on research engagement in Cambodia in general - An argumentative essay - Only social research disciplines	- Specific focus on lessons learnt from implementing research promoting program and the DIG scheme for universities - A practical and quasi-evaluative study - Unspecified disciplines of research	- Comprehensive coverage on states of research capacities in Cambodia in general - An exploratory, explanatory and capacity-improving project - Only social research disciplines
Scope of study's samples	- 19 key informant interviewees from 15 selected universities - 8 experts from different institutions who experience in and with Cambodian higher education sector	- No primary data collected	- 37 HEQCIP grant subproject managers (with 35 completing questionnaire survey) from 24 higher education institutions - 16 higher education institution leaders - 7 key informant interviewees	- 183 survey respondents - Interviews and focus group discussions
Research methods	Semi-structured key informant interviews and	An opinion essay or a discussion paper	Multiple methods (i.e. survey, interviews, and	Multiple methods (i.e. survey, interviews and

[10] This matric summary aims to highlight just the key points emphasized by authors of the four texts. Where possible, the researcher used *in vivo* wordings exactly from the original text.

	document reviews		document reviews)	action-research training and reflection)
Key arguments on the state of Cambodian research capacities	- Acknowledged low engagement and performance of research in Cambodia due to systemic gaps and limitations - Offered evidence that research is in transition through increased number of researchers and by highlighting some positive cases of research-engaged universities in Cambodia	- Acknowledged low engagement and performance of research in Cambodia, basically due to political influences - Offered evidence that donors' funding and some non-governmental research institutes are factors pushing research in Cambodia	- Acknowledged low engagement and performance of research in Cambodia to due systemic gaps and limitations, but highlighted research competencies as one key challenge - Offered evidence that current support from government through the DIG scheme has influenced research capacities at universities (increasing resources, raising capacities, sprouting research cultures, etc.)	- Acknowledged low engagement and performance of research in Cambodia due to systemic gaps and limitations - Offered some positive opinions that interest and values in research exist in Cambodia
Key arguments on factors influencing Cambodian research capacities	- Missing generation - Academic profession - Research facilities - Academic leadership and management - Long-term goals for research - Academic salaries - Brain drain - Funding package - Research not a core mission	- Patronage network in career promotion - Political decision as the root or frame of all institutional phenomenon - Not much concern on expert knowledge - Institutional resources and infrastructure allocated based on political decisions	- Research competencies of faculty members - Demotivation of researchers' commitment (due to more workloads and no incentives) - Complicated standards, administration, financial management, and procurement procedures by the donors and the internal	- Financial system (funding, academic salaries and incentives) - Capacity to conduct research and language competencies - Workloads - Retention - Research quality mechanisms - Access to data - Political sensitivity

		- Researchers co-opted into serving political agenda with the - expectation of lucrative benefits in returns - Donors as key actors in pushing research engagement	system of the university - Shallow and sporadic capacity-building training - Lack of communication between donors and grant recipients - University research-support teams and platforms are not strong	- Access to academic resources
Key points of *recommendations*	- Clarifying what is at stake and championing university research - Planning for a differentiated higher education sector - Making research a core mission of universities - Establishing long-term goals - Extending Development Research Forum - Working with stakeholders of this study to follow up further development	- Establishing an academic or research support system that ensures researchers' freedom, creativity and appreciation	- Long-term goals in research promotion - Balancing workloads - Institutional and public recognition of research outputs and researchers - Salary scheme - Public and donor-based financial resources to fund research performance and research supports - Intense research supports - Linkage between Cambodian and international scholars - Financial compensation and incentives	- Adequate funding to incentivize researchers - Access to academic journals and resources - Collaboration across universities, stakeholders and between local and international researchers - Setting standards and regulations by the state - Training and capacity-building by stakeholders

Key** recommendation **on specific model of capacity-building training	Development Research Forum (DRF)	N/A	Higher Education Quality and Capacity Improvement Project (HEQCIP) and Development and Innovation Grants (DIG)	Action research (i.e. training or capacity building along the way of researching)