Managing *change*: The policy implications of constraints to *ICT adoption* within Cambodian Higher Education Institutions

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✓ ខណៈដែលលទ្ធផលនៃការស្រាវជ្រាវបង្ហាញថា ការរៀបចំគោលនយោបាយ (ការបញ្ចូលបច្ចេកវិទ្យាព័ត៌មាន និងសារគមនាគមន៍ទៅក្នុងការសិក្សានៅ តាមគ្រឹះស្ថានឧត្តមសិក្សា) ពីថ្នាក់លើចុះមកក្រោមពុំសូវមានប្រសិទ្ធិភាព អត្ថបទនេះចង្អុលបង្ហាញពីលទ្ធភាពនៃការរៀបចំគោលនយោបាយ (ជំនួយ) ពីថ្នាក់ក្រោមឡើងទៅលើ ដើម្បីបង្កើនប្រសិទ្ធភាព។

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ចេញពីភាពជាក់ស្តែងនេះ នឹងអាចធានាបាននូវនិរន្តរភាពជាងគោនយោបាយ និងបទប្បញ្ញត្តិដែលពឹងផ្អែកតែលើជំនួយពីខាងក្រៅ។ ជាងនេះទៅទៀត គោលនយោបាយ និងបទប្បញ្ញត្តិទាំងនោះក៏នឹងអាចកសាងទំនុកចិត្តពីគ្រប់ បណ្ដាអ្នកចូលរួម ដែលជាកត្តាចាំបាច់សម្រាប់ការប្រើប្រាស់ប្រព័ន្ធបច្ចេក វិទ្យាព័ត៌មាន និងសារគមនាគមន៍ក្នុងការសិក្សាប្រកបដោយប្រសិទ្ធភាព។

Key Messages

✓ An assessment of information and communication technology (*ICT) adoption* within Cambodian higher education institutions (HEIs) identified inefficiencies in existing *top-down* ICT policy frameworks. This paper outlines a complementary pathway of *bottom-up* policy development within HEIs to improve this situation.

✓ While recommending that the MoEYS focuses on creating a conducive environment (for change management), this paper also advocates for the leaders of HEIs to establish supportive policies informed by the science of change management.

✓ For these policies to be practical, they need to be iterative, stemming from previously successful, contextual models of change that are responsive to resource constraints. This may result in practices that are more sustainable than those that are externally funded, and build the trust required for effective *ICT adoption* to occur.

Keywords: information and communication technologies; higher education institutions, policy frameworks; ICT adoption; change management.

Introduction

Information and communication technologies (ICTs) have become key to pedagogical and educational processes in higher education institutions (HEIs) in Cambodia and help to improve educational outcomes. ICTs facilitate interactive learning (Reutova, 2012), improved cognition, and professionalism

(Atanasyan et al., 2007). They have enabled new learning experiences for students (Poon, 2013).

Jacobsen (1998) presents evidence from the US that the integration of technology [into HEIs] supports a shift from a primarily *knowledge-transfer* mode of content delivery to a *knowledge-construction* mode of teacher-student interaction. However, this often results in increased teaching workloads due to the need to develop materials and interact with students (Samarawickrema & Stacey, 2007). Yet, the importance ICTs means that many countries in the Asia Pacific have mandated that they be embraced by HEIs (ADB, 2018). Cambodia is no exception. In December 2015, the Royal Government of Cambodia (RGoC) established policy priorities across multiple ministries, as part of the fifth legislature, to upgrade ICT infrastructures. This was reflected in an allocation in the national budget.

In the Master Plan for ICT in Education 2009-2013, the Ministry of Education Youth and Sport (MoEYS) outlined a long-term vision to promote a five-point agenda for ICT adoption (KOICA, 2014, p.63). This agenda was intended to integrate ICTs into public institutions and ensure their effective management. More detailed areas of focus included the digitization of schools; the establishment of online libraries; the establishment of school management systems, with student IDs; and the construction of computer labs in schools.

Further efforts have been made to integrate ICTs into HEIs in Cambodia e.g. the *blended learning practices* in place at the Institute of Technology of Cambodia. A range of other initiatives was also introduced in response to school closures due to the Covid-19 pandemic, such as the implementation of

distance learning via a Learning Management System (LMS). Meanwhile, ongoing on-the-ground challenges have emerged as a result of the lack of preparedness of education institutions to embrace *changes* that have been rapid and all-encompassing.

The progress of ICT adoption reforms in the Cambodian education system has been limited (Richardson, 2008) to specific institutions. For example, a platform called *Moodle* was incorporated as part of an LMS implemented at the National Institute of Posts, Telecommunications and ICT (NIPTICT) to facilitate teaching and learning practices. The outcomes of this work were presented at the 1st MoEYS e-Learning Forum in 2020. At the Royal University of Phnom Penh (RUPP), *ICT adoption* is in the early stages of piloting (RUPP, 2015). Constraints including insufficient external bandwidth; a lack of intranet for services, such as email and e-learning; limited Wi-Fi coverage; and insufficient computer resources currently impede progress (RUPP, 2015). This mismatch between policy and practice is the focus of this reflection paper. It aims to identify the challenges that exist and improve the readiness of education institutions to prioritize the adoption of ICTs.

A lack of on-the-ground institutional policy currently negatively impacts the existing efforts made at both the ministerial and national levels. This paper outlines a solution whereby relevant policies across three different levels are more effectively integrated so that they may influence institutional change. Practical recommendations are provided as to how this may occur.

Methodology

This exploratory study employed an interpretivist approach using qualitative methods for data collection. Existing policy documents including

national, ministerial and institutional policy frameworks were reviewed. This was followed by a series of unstructured telephone interviews with seven participants recruited from middle and top management within six HEIs in Cambodia. Participants were purposefully selected based on their role within the institution and their knowledge of the implementation of ICT policies. The interviews aimed to verify information from the grey literature sourced from each institution (Appendix A). The policy settings and ICT practices of two of these HEIs are discussed in this paper. They are denoted as HEI 1 and HEI 2 respectively. Within this discussion, the term *ICT* is synonymous with *ICT-assisted teaching and learning technologies. Change* refers to the shift from *traditional* to *ICT-assisted* practices, or *ICT adoption*.

Results and Findings
National ICT policy framework

The challenges that constrain ICT adoption within academic institutions are numerous (Andersen, 2018) and in Cambodia includes financial constraints, inadequate human resources, centralized management (Sorm & Gunbayi, 2018). The RGoC has made ongoing efforts to develop policies that respond to these challenges. For instance, in 2014, Cambodia's National Assembly approved a 26.6 billion USD budget drawing from both domestic and foreign sources. This was allocated for the implementation of an ICT development plan as part of the National Strategic Development Plan (NSDP) 2014-2018 (MoP, 2014).

As the economic blueprint for the country, the NSDP 2019-2023 has since continued to emphasize ICT development as part of the government mandate. The RGoC has maintained its focus on human resource development and ICT

infrastructure (MoP, 2019), highlighting the need for cooperation across relevant ministries and institutions to further prepare ICT Master Plan and Policy on the Development of ICT 2020. Within these documents, concrete actions such as the provision of a bachelor degree, tailored to the needs of civil servants in all provinces working for the Ministry of Post and Telecommunication (MPTC); award programs to develop ICT skills among women; and campaigns to build awareness of ICTs in rural areas, especially for vulnerable people, have been planned.
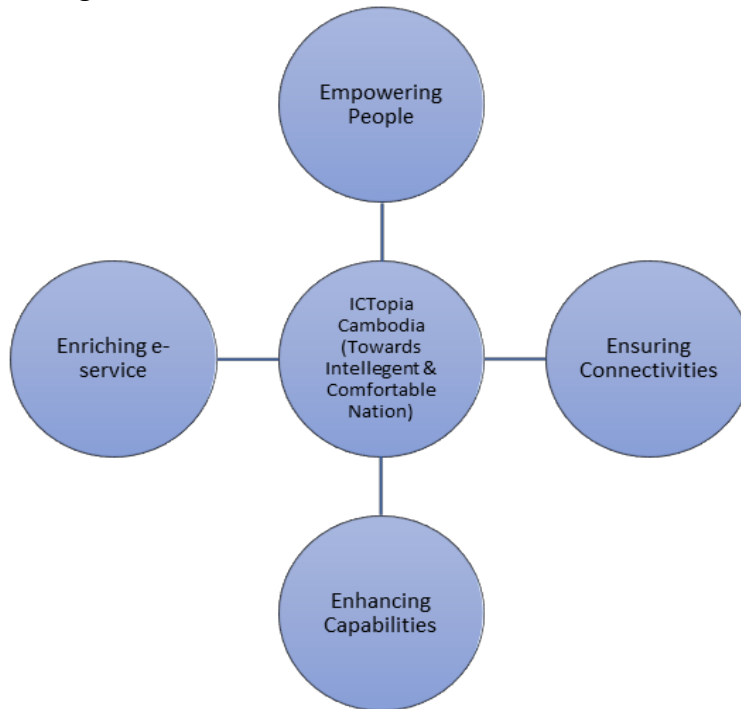
Ministerial ICT policy framework

Guided by the NSDP (2014-2018), the MPTC produced an ICT Master Plan supported by the Korean International Co-operation Agency (KOICA) across four themes including *Empowering People*, *Ensuring Connectivity*, *Enhancing Capabilities*, and *Enriching e-Services* (see Figure 1) (KOICA, 2014). The latter element encompasses e-Government Services, e-Public Services, e-Economy Services as well as e-Education Services and is aimed at better service delivery for citizens to help realize the benefits of ICT, such as improved quality of life. The focus on e-Education Services was incorporated into the Master Plan for ICT in Education (2009-2013) and the Education for All National Plan (2003-2015) developed by the MoEYS. Within these plans, an intention to create an environment that fosters e-learning, e-schools and the e-contents necessary to teach and learn in an increasingly digital and connected world has been outlined.

The MoEYS has released subsequent policies including the Education Strategic Plan (ESP) 2014-2018, Policy and Strategy on Information and Communication Technology in Education 2018 and the ESP 2019-2023

(MoEYS, 2010, 2014, 2019). These policies were intended to foster an environment for education institutions to adopt ICTs. Aligned with this objective, the MoEYS has implemented several strategic action plans focused on the decentralization and de-concentration of decisions to the sub-national level.

Figure 1. Strategic Areas of the Cambodian ICT Master Plan 2020

Adapted from KOICA (2014)

Institutional ICT policy framework

Acknowledging the importance of institutions in implementing national and ministerial policies, the preface of the ESP (2014-2018) stressed the need to provide these institutions with the right resources and policy mechanisms to improve educational outcomes. As such, the MoEYS delegated authority for a range of functions to educational institutions such as schools and

universities through a process of decentralization and de-concentration (MoEYS, 2014).

At the tertiary level, this autonomy manifested via the granting of Public Administrative Institution (PAI) status to public universities. This was intended to provide more financial autonomy to HEIs to implementing local priority agendas (Touch et al., 2014). Under this status, universities gained the capacity to set up and manage their budget and programs, which was previously not possible. Financial independence was considered a requirement for HEIs to establish longer-term visions that respond practically and incrementally to each specific institutional context.

Although these reform strategies were meant to give ground institutions the right resources and power to manage their own fortune, almost none of them have successfully use the given status for ICT adoption into their academic settings [Participant 1, 2, & 3]. Desk reviews, backed by interviews at HEI 1 and HEI 2 identified a lack of institutional policy as a major constraint impeding ICT adoption in Cambodian HEIs [Participant 2 & 7]. The ICT policy framework of the 2009-2013; 2014-2018; and 2019-2023 were found to be reflected in strategic plans of HEI 2. However, this was not found to be the case for any other HEIs, who had no written policies on ICT adoption [Participant 2, 3, 4, 5, 6, & 7].

This situation is assumed to emanate from internal management issues beyond the scope of this study. Nonetheless, even at HEI2, where plans for *ICT adoption* were in place, they were assessed to be irrelevant and misaligned with expectations set in ministerial and national guidelines. A joint study between the Sweden International Development Cooperation Agency (SIDA)

and HEI2 noted, *"… this plan is, in reality, a framework as it does not provide clear policy to guide strategy; it does not sufficiently detail strategies for achieving policy objectives; it does not set time-bound targets; and there is no master planning budget for achieving all the objectives. There is in addition, no section on assumptions and risks"* (HEI2, 2015, p15).

Implications for the capacity of HEIs to manage change

It is difficult to gauge the extent to which policy challenges impact the capacity of HEIs to manage change. However, a lack of policy at the institutional level poses problems for the readiness of HEIs for *ICT adoption*, even as effective policies are in place at the national and ministerial levels. For example, when the Covid-19 pandemic forced HEIs to rapidly embrace change, none were prepared to introduce online learning as a replacement for face-to-face delivery. As there were no relevant ICT policies in place, universities chose to wholly adopt policies devised at the ministry level, irrespective of the local context. This resulted in outcomes that were less than effective and not sustainable.

A lack of preparedness at the institutional level, especially for HEIs manifests in various forms including a poor capacity to mobilize human, technical and financial resources; no established strategies to effectively manage change; reactive and unsystematic responses to unforeseen emerging issues; an absence of stakeholder consultation; and an underestimation of the need for participation in change processes. This ultimately leads to resistance to change (Kotter, 1996). There is also a need for the aforementioned challenges to be systematically addressed via integrated policies linking practical institutional strategies with ministerial and national directives.

While some see the absence of institutional policy as a cause of unpreparedness, others see it as a consequence of these institutional challenges. This is due to the lack of resources for policy development. *Change* programs, particularly those driven by ICTs tend to be externally funded and project-based. For instance, most of the online programs at HEI 1 and HEI 2 rely on external funding i.e. the *flipped classroom initiative* at HEI 1 was heavily supported by the Asian Cyber University (ACU) project [Participant 7]; and the integration of a *blended learning program* at HEI 2 required financial support from SIDA and UNESCO. These project-based programs do not support local institutional policy planning and execution [Participant 1 & 2] and tend to cease when project funding is withdrawn.

As a result, HEI managers tend to apply reactive approaches to *change* and neglect to manage it strategically. This is one reason why practical policies to direct grassroots change are scarce at HEIs. The literature on institutional change management focuses on success being driven by the ability of managers (Andersen, 2018; Bamford & Forrester, 2003; Burnes, 2011). Thus, there is a need to consider the current level of competency in managing change recognizing that change in itself, is not necessarily a problem (Paton and McCalman, 2008); designing, evaluating and implementing successful change strategies largely depend upon the capacity of a management team to design change processes that are responsive and progressive (Paton & McCalman, 2008).

The management of change is frequently misinterpreted by management teams. Khan et al. (2012) noted that many practitioners believe that the implementation of change, such as the introduction of *blended learning*

technologies, does not require focused management beyond effective technological tools, skills monitoring, and financial support. Paton & McCalman (2008) present a further argument that in fact, change management requires integrated strategies that combine fit-for-purpose technological, organizational and people-oriented solutions to produce wholistic, effective results. In the context of Cambodian HEIs, many of the interview participants confessed to having no strategy for managing change. When technical change is introduced, management tends to inform staff that a change is being made and they provide training for those who do not know how to operate the new system. However, in this case, often the available resources for managing change are not used effectively, and a general conclusion may be drawn that much of the activity is reactive and applied to mitigate, rather than embrace change. This neglects the application of tactical strategies such as planning, researching, implementing and evaluating; often meaning that change efforts are less effective, short-lived and perhaps even unsuccessful.

The availability and use of ICTs at HEIs tend to be quite limited. For instance, a study at HEI2 in 2017 reported numerous technical constraints, including insufficient bandwidth for the 35,000 devices used on campus; a lack of intranet for services such as email, and e-learning; poor WiFi coverage; inadequate computer resources, with 15% of students lacking access to a computer, or their own laptop; and limited system architecture and software. These constraints present a significant challenge to the adoption of ICTs within HEIs. While financial commitments have been made by the government and responsible ministries, the receipt of these resources is often poorly

timed. Complex procurement procedures impede the responsive use of these funds for urgent needs, such as those that arose during the Covid-19 pandemic.

For *change* to be managed effectively, local institutional policies need to be established to guide practice. These policies need to be practical, reflecting the context to which they are applied; and capable of addressing the challenges faced on the ground. Policies need to be iterative and developed in response to constraints if they are to be successful.

Discussion and Policy Implications

Attempts to integrate ICTs into HEIs are reflected in several policies and plans at: the national level such as the NSDP 2019-2023, and the ICT Master Plan 2020; and the ministry level such as the ICT in Education Master Plan 2009-2013, the ESP 2014-2018 & 2019-2023. These directives have provided sufficient top-down guidelines for ushering in a new paradigm of digital learning at the institutional level. However, there is a gap between these higher-level policy documents and the situation on the ground. There remains little evidence of practical reform at the tertiary level, except for a few instances where PAI status has been granted to HEIs. As an alternative, these changes should be driven by internal policies and a bottom-up change model to create a conducive environment for ICT adoption.

Effective Institutional Change: A Practical Bottom-Up Policy Framework

The absence of a successful change model at the institutional level should not be overlooked when assessing current practices. Kotter (1996) noted that two-third of change programs fail; a figure also supported by Burnes (2011). This implies a need for foresight and a change management framework. The

application of this framework should extend beyond replicating change in other contexts, to generating evidence that guides positive outcomes at multiple scales. The ESP 2019-2023 was developed in line with this finding, stressing the importance of focusing on the adoption of new management and administrative processes to improve the efficiency, transparency and effectiveness of outcomes. The same insight comprises the ICT Policy of one of the HEIs assessed as part of this study. It calls for the adoption of change management processes to increase the likelihood of success of ICT adoption strategies.

The term management in the current Cambodian HEI context generally refers to day-to-day operations, whereas change management is more strategic; focused on identifying priorities and targeting innovation via specific processes in line with available resources. When management is aligned with the strategic objectives of an organization, the likelihood of successful, sustainable outcomes increases. Paton and McCalman (2008) highlight that managers cannot separate strategic change management from day-to-day organizational strategies; and both must work in tandem if failure is to be avoided.

There is no *magic bullet* for managing change, however, some appropriate frameworks for strategic change management have been presented in the literature (Burnes, 2004; Kotter & Schlesinger, 2008; Som et al., 2020b). While these approaches vary temporally and contextually, they share common characteristics: For instance, a *change,* such as the successful adoption of technology begins with defining a *change scope*, which provides staff, or *change agents,* with a clear picture of what actions need to be taken;

at what scale (*departmental, institutional, or nationwide*); at what rate (*incremental, continuous, discontinuous*); and in what manner (*top-down, or bottom-up*).

Once this scope has been defined, the process of change needs to be clarified to enable the management of an HEI to determine priorities for change at each level (Som et al., 2020a). In this regard, a five-step process presented by (Judson, 1991) may be relevant in the Cambodian context. This model does not reject top-down intervention from policymakers but provides the scaffolding required to provide on-the-ground managers with the flexibility to respond proactively to *change*. This involves (i) analyzing and planning for change; (ii) communicating the change; (iii) gaining acceptance for new required behaviors; (iv) shifting from a status quo to the desired state, and (v) consolidating and institutionalizing change.

Another, indispensable aspect of the ICT adoption is to consider the elements of change. A thorough assessment of human, technical and strategic *change elements* (Som et al., 2020b) will enable insights into the strengths and weaknesses of each business unit, and how well they complement each other. Successful change is the product of the harmonious interaction of these three elements. For instance, when *change* is implemented at the university level, upper-level management must ensure all three of these elements are aligned. Well-functioning human resources, without supporting technology, or vice-versa, is unlikely to result in successful *change*. If these two elements are balanced, but there is a lack of strategy to promote the mobilization of resources; the diffusion of fear about change; the creation of a sense of urgency; and participatory dialogue, the chance of success is reduced.

To apply this model to the study context, the MoEYS would be required not only to communicate their intent for *change* to occur to HEIs but also to prompt them to establish local priorities. To reduce resistance, open and participatory communication among platforms should be established, alongside an effective monitoring process. Although the MoEYS would not be expected to directly implement *change*, they retain a responsibility to create an environment that is conducive to *change*. If this occurs, HEIs will be enabled to develop locally responsive policies that are appropriately scoped, and strike a balance between available human resources, technology and strategies, in a timely manner. This only becomes possible if a will for *change* is established among middle managers at an HEI, such as university rectors.

For effective *change* at the institutional level, appropriate higher-level support is required. The RGoC could facilitate this by first securing funding for HEIs to practice and sustain change management strategies over the long term. Timely, decentralized management required sufficient public financing from the RGoC to be successful. The MoEYS needs to guide HEIs to directly seek partnerships for ongoing support, and adapt policies to be aligned with practical on-the-ground realities. Effective reform would see the MoEYS promoting monitoring and evaluation practices within HEIs to ensure that policies support the development of a conducive environment for change. The HEI should be encouraged to execute *change* based on iterations of previously successful models. Underestimating local knowledge is likely to lead to *change* that cannot be sustained.

Conclusion

Preparedness for *ICT adoption* into HEIs, such as in the form of a *blended learning program*, *flipped classroom*, or online learning; has yet to be well established at the institutional level in Cambodia. This is despite effective policy drivers for ICT adoption being in place at the national and ministerial levels. While there are some examples of progress, those initiatives for change tend to be short-lived, which is indicative of a lack of readiness; and a likelihood of failure once external funding is withdrawn. This tends to result in a relapse to old teaching and learning practices, and an environment that is not conducive to *ICT adoption*.

Several constraints to adopting ICTs within Cambodian HEIs have been identified in this paper. The most significant of which is the absence of policies to support the practical implementation of strategic plans at the institutional scale. While *top-down* national and ministerial policies are believed to be sufficient for *ICT adoption*, the development of *bottom-up* or institutional policies remains a critical challenge that thwarts *change* efforts. Thus, a focus on bottom-up, institutional policy development is required. For these policies to be practical, they need to be iterative, stemming from previously successful, contextual models of change that respond to existing resource constraints. This has the potential to result in practices that are more sustainable than those that are externally funded, and build the trust required for change to occur. While recommending that the MoEYS focuses on creating an environment more conducive to change, this paper also advocates for the leaders of HEIs to establish supportive policies informed by the science of change management.

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Appendix. List of interviews

Code	Position	Date
Participant 1	Deputy Head of Institute/ Faculty	19/10/20
Participant 2	Head of Department	19/10/20
Participant 3	Dean	19/11/20
Participant 4	Vice-Rector	19/11/20
Participant 5	Rector	19/11/20
Participant 6	Vice-Rector	19/11/20
Participant 7	Head of a Department/ Head of a center	19/11/20