

Central Lancashire Online Knowledge (CLoK)

Title	Understanding University Enterprise Collaboration for Disaster Resilience in
	South-East Asia
Type	Article
URL	https://clok.uclan.ac.uk/id/eprint/47820/
DOI	https://doi.org/10.1108/IJDRBE-02-2023-0010
Date	2023
Citation	Tucker, Rebeka Catherine, Liyanage, Champika Lasanthi, Robinson, Sarita Jane, Montebon, Darryl R, Gotangco Gonzales, Kendra, Olpoc, Joselito C, Patacsil, Liza B., Tantanee, Sarintip, Buranajarukorn, Panu et al (2023) Understanding University Enterprise Collaboration for Disaster Resilience in South-East Asia. International Journal of Disaster Resilience in the Built Environment. ISSN 1759-5908
Creators	Tucker, Rebeka Catherine, Liyanage, Champika Lasanthi, Robinson, Sarita Jane, Montebon, Darryl R, Gotangco Gonzales, Kendra, Olpoc, Joselito C, Patacsil, Liza B., Tantanee, Sarintip, Buranajarukorn, Panu, Apichayaku, Orawan Sirisawat, Weerasinghe, Rukmal N., Dissanayake, Ranjith and Weerasinghe, Nandasiri

It is advisable to refer to the publisher's version if you intend to cite from the work. https://doi.org/10.1108/IJDRBE-02-2023-0010

For information about Research at UCLan please go to http://www.uclan.ac.uk/research/

All outputs in CLoK are protected by Intellectual Property Rights law, including Copyright law. Copyright, IPR and Moral Rights for the works on this site are retained by the individual authors and/or other copyright owners. Terms and conditions for use of this material are defined in the http://clok.uclan.ac.uk/policies/



Understanding University Enterprise Collaboration for Disaster Resilience in South-East Asia

Journal:	International Journal of Disaster Resilience in the Built Environment
Manuscript ID	IJDRBE-02-2023-0010.R2
Manuscript Type:	Research Paper
Keywords:	Resilience, Collaboration, Disaster mitigation, Inter-disciplinary working, Knowledge sharing, Law and regulatory frameworks

SCHOLARONE™ Manuscripts

Interna	ational Journal of Disaster Resilie	ence in the Built Environme	ent	
Understanding Univ	ersity Enterprise Collabo	ration for Disaster Res	silience in South-	
	East Asi	a		
			1	

Page 1 of 53

23 Introduction

This paper is based on the initial findings of an ERASMUS+ project, Strengthening University Enterprise Collaboration for Resilient Communities in Asia (SECRA). The project focuses on three Asian countries: the Philippines, Sri Lanka and Thailand. University Enterprise Collaboration (UEC) refers to collaborative initiatives between universities and external stakeholders, exchanging knowledge, resources, and expertise to address challenges and promote mutual benefits. The concept of collaboration between universities and various sectors, including business, non-profit organisations, and government departments, has been widely disseminated (Awasthy et al., 2020; Guimón, 2013; Larsen et al., 2016).

Collaborations create advantages for both universities and enterprises. For example, successful collaborations allow universities to engage in up-to-date problem-based projects, secure funding and use their knowledge and skills in real-life situations (Larsen et al., 2016; Singh and Prakash, 2010; Tantanee et al., 2019). Conversely, enterprises can utilise academic knowledge for their projects, obtain better profits, lower costs, and become knowledge-based enterprises (Ankrah and Al-Tabbaa, 2015). Collaborations also benefit broader society, which profits from innovation and invention (Buys and Bursnall, 2007).

Collaborations between universities and enterprises are considered necessary by educators and policymakers in all partner countries to enhance DRM (Asian Preparedness Partnership, 2021), disaster recovery (Kong, 2013) and risk reduction (Burke Rolfhamre, 2019). Disaster resilience (DR) encompasses the capacity of communities, organisations, and systems to withstand, adapt to, and recover from disasters. It involves various dimensions: mitigation, preparedness, response, recovery, and long-term adaptation (Bullock et al., 2012). DR-UEC integrates the principles of UEC to strengthen DR. Consequently, DR-UEC entails collaborations between university, enterprise and government stakeholders to develop

innovative approaches, solutions, and strategies for disaster mitigation, preparedness, response, and recovery (Kaklauskas et al., 2018; Randil et al., 2018).

Document reviews were conducted in the Philippines, Sri Lanka, and Thailand to explore primary topics related to DR-UEC, including the current context and good practices. The current context of DR-UEC covered UEC models, policies, barriers, and enablers. Good practices showcased successful examples of DR-UECs in the partner countries. The paper aims to synthesise the findings and offer recommendations for implementing successful UECs for DR in the three Asian partner countries. These research findings provide the basis for developing a heuristic framework that guides DR-UECs.

Methodology

Documentary reviews were conducted in each partner country using systematic search strategies in relevant databases. The analytical unit was primary and secondary sources. Primary sources, such as laws, regulations, and strategies, are essential in DR-UEC research as they capture information regarding official policies and legal frameworks in each partner country. The analysis of primary sources allowed the efficacy and implementation of DR-UEC laws, regulations and strategies to be evaluated across the partner countries. Secondary sources, notably academic articles, offer broader perspectives encompassing theoretical frameworks, empirical evidence, case studies, and expert opinions. Secondary sources facilitate critical evaluations by contextualising DR-UECs and permitting evaluations between perspectives and findings. Secondary sources supplement the findings derived from primary sources, thus enriching the DR-UEC discourse.

The research leads in each partner country were briefed on the methodology for the documentary reviews to facilitate a consistent and valid synthesis of findings across all country reviews. Sources were derived from Google Scholar, Scopus and Science Direct. Grey and

indexed literature were sourced from local and national conferences, Academia.edu, government reports, policy papers, research reports, handbooks and manuals through official websites. This allowed crucial contextual information to be identified about DR-UECs in the partner countries to understand specific issues in DR-UECs and where and why further development and evaluation are required.

All searches used a combination of search terms, including:

- "University Enterprise Collaboration", "University-Industry Partnership",
 "University-Industry Collaboration", "University-Industry Linkage", and "Public Private Partnership"; AND
- o "Disaster Risk Management", "Disaster Risk", Disaster Mitigation; AND
- "Partner Country Name"

According to the partner countries, some search terms were slightly modified to reflect their common use terms, e.g., "Academe industry partnership Philippines".

Eligible literature published after 2000 was considered, focusing on literature from the last ten years to ensure up-to-date information. Relevance to the research aims, which included DR-UEC models, policies and initiatives, barriers and enablers, and good practices, was used to assess the eligibility of identified literature. The number of citations received by a literature source was considered an indicator of quality.

Qualitative content analysis was applied to the country reviews to systematically identify and analyse common themes and concepts across the partner countries. Content analysis provides a systematic approach to data analysis, ensuring objectivity and reliability. A concept-centric approach was adopted to synthesise concepts that emerged from the country reviews and determine the point of data saturation, where no new concepts emerged (Webster and Watson, 2002). The concept-centric approach is considered superior to an author-centric

approach as it enables the synthesis of concepts within and between articles (Webster and Watson, 2002).

A comprehensive analysis of the country reports was conducted, identifying broader concepts encompassing shared characteristics and themes across the reports. Matrices were created to synthesise common concepts between articles, and an iterative process involving multiple reviewers was employed to interpret the findings. This approach allowed for a deeper understanding of DR-UECs across all partner countries.

102 Results

One hundred thirty-nine sources were included across all country reports, including thirty-three grey literature sources, fifty-nine journal articles, twenty-four government documents, six books/chapters, and seventeen websites (See supplementary file).

Current context

The analysis of the current context of DR-UECs across the partner countries yielded findings across four distinct domains: policies, models, barriers, and enablers.

Policies and Incentives

UEC policies in the Philippines focus on education and training in enterprises. Executive Order No. 83 led to collaboration among government agencies such as the Department of Education, Technical Education and Skills Development Authority, Commission on Higher Education, Professional Regulation Commission, and Department of Labour and Employment to develop the Philippine Qualifications Framework (PQF). The PQF aims to improve education and training, develop lifelong learners, and establish industry-aligned training standards and qualifications (Symaco and Bustos, 2021).

In Sri Lanka, the government started supporting UEC in 2005 when the university grants commission granted annual leave for senior university academics to work in enterprises (Wickramasinghe and Malik, 2018). In 2014, the Sri Lankan government introduced a triple tax deduction mechanism for enterprises engaged in research with universities (Wickramasinghe and Malik, 2018). The UGC also provided grant funding for UECs in various areas in 2015 (Wickramasinghe and Malik, 2018), including:

- o Innovations and research conducted in pure sciences.
- o Research that directly impacts society.
- o Post-doctoral researchers for academics.
- o National and international training programmes for academic staff.
- Loans with favourable terms and conditions for academic staff to commercialise products derived from research and innovation (R&I).

Thailand has developed comprehensive policies for DR, highlighting several strategies, sub-strategies, and DRM operational guidelines (Department of Disaster Prevention and Mitigation, 2015). The 12th National Economic and Social Development Plan (2017-2021) promotes research and development, intelligent technology, and entrepreneurial skills (Office of the National Economic and Social Development Board, 2017). It also aims to increase connectivity between major production sectors, small and medium enterprises (SMEs), research institutes and the academic sector (Office of the National Economic and Social Development Board, 2017). See Table I.

INSERT TABLE I HERE

DR-UEC Models

The triple helix model (Etzkowitz and Zhou, 2017) highlights interactions between academia, industry, and government to promote economic and social development. However,

the Philippines adopted an extended version of the triple helix - the human capital development model (Hermosura, 2019). This model elucidates interactions between universities, government, and industries for economic and social development and provides practical suggestions for successful collaborations (Hermosura, 2019). The Philippines review also highlighted other frameworks, including the Student Internship Model, the Faculty Immersion Model, the R&I Model, and Research and Extension Model.

The student internship model promotes internships, on-the-job training, and work placements with enterprises to provide opportunities for students to acquire competencies for employment (Navarro, 2018). The faculty immersion model encourages academic researchers to engage with enterprise projects to enhance their knowledge and skills (Abendan, 2017). The R&I model supports universities in facilitating the discovery of new knowledge, integrating theories and skills, and applying relevant knowledge (Sevilleja, 2014). The research and extension model promotes the transfer of knowledge, skills, and technology from academic research to enterprises, fostering industry experience and innovative solutions (Hall et al., 2018).

The student internship model promotes internships, on-the-job training, and work placements with enterprises for students to acquire competencies (Navarro, 2018). The faculty immersion model encourages researchers to engage with enterprise projects to enhance their knowledge and skills (Abendan, 2017). The R&I model supports universities in facilitating the discovery of new knowledge, integrating theories and skills, and applying relevant knowledge (Sevilleja, 2014). The research and extension model promotes the transfer of knowledge, skills, and technology from academic research to enterprises, fostering industry experience and innovative solutions (Hall et al., 2018).

In contrast, the Thailand review utilised its UEC model to strengthen competitive production and promote technology-intensive and innovation-driven service sectors via knowledge transfer (Office of the National Economic and Social Development Board, 2017). The UEC model has been implemented through government programs such as talent mobility, collaborative research projects, industrial consultancy, economic innovation, university business incubators, and entrepreneur creation projects (Schiller and Diez, 2007). However, the primary focus of the UEC model was commercial gain rather than addressing DR (Tantanee et al., 2018). See Table II.

INSERT TABLE II HERE

DR-UEC Barriers

The barriers identified encompass several factors that can hinder the development, maintenance or success of a DR-UEC. Material barriers refer to tangible obstacles related to the availability or accessibility of resources, infrastructure, equipment, facilities, or technology. Structural barriers are systemic factors and conditions often ingrained in social, economic, political, or organisational structures. Cultural barriers refer to the challenges arising from differences between cultural norms, values, beliefs, attitudes, and practices between organisations. Relational barriers refer to obstacles that arise in the relationships between stakeholders. Refer to Table III for a breakdown of each barrier and concept identified within each country review.

INSERT TABLE III HERE

DR-UEC Enablers

The country reviews highlighted several enablers of DR-UEC. These enablers, again, encompassed material, structural, cultural or relational concepts, alike the barriers discussed previously. However, enablers oppose barriers in that they facilitate the development,

maintenance, or success of a DR-UEC. Refer to Table IV for a breakdown of each barrier and concept identified within each country report.

INSERT TABLE IV HERE

Good Practices

Good practices in UECs across the partner countries typically encompass activities related to service and training, patenting, collaborative R&I, networking events, industrial collaboration for education, incubators, SME support, and science parks (Moeliodihardjo et al., 2012). The good practices identified across the country reviews provide examples of how stakeholders can engage in UEC for DR (see Table V).

INSERT TABLE V HERE

198 Discussion

Policies and Incentives

The reviews in each partner country highlighted the need for general UEC policies and initiatives and specific policies for DR-UEC. As the governing agency of universities in the Philippines, CHED issued various UEC policies. In 2014, CHED, DepEd, TESDA, and DOLE jointly released a guideline to address employment concerns during the transition to the new K to 12 programs. Initially, primary education in the Philippines lasted ten years, although there were proposals to extend it by two years (Adarlo and Jackson, 2016). However, these proposals faced criticism due to the increased workload for teachers without clear benefits in equipping students with skills for work and addressing unemployment (Calderon, 2015).

Despite efforts to improve the Philippine education system, these initiatives do not specifically focus on DR. Instead, the additional two years of compulsory education prioritise specialised areas such as sports, arts and design, or technical-vocational subjects (Cabalfin et

al., 2019). Whilst some of these areas may broadly encompass DR, it is unclear how these changes will benefit society for DR education, training, and skill development.

The assistance programs in Executive Order No. 104 include professional development, livelihood development, and welfare assistance. For instance, CHED Memorandum Order (CMO) No.14 introduces the Sectoral Engagement Program (SEP) for teachers affected by the curriculum change. Through SEP, teachers can work full-time or part-time in their chosen enterprise, enjoying a reduced working scheme and financial assistance upon successful application (Cabalfin et al., 2019). Teachers engaged in SEP enhance their skills and knowledge to share with students upon their return to teaching (Brillantes et al., 2018). Enterprises benefit as they no longer need to pay for specific services or professional expertise that other employees can learn from (Brillantes et al., 2018).

CHED issued CMO No. 52 Series to guide R&I and extension programs between universities and potential collaborators. The Series outlines the benefits of UECs for universities and enterprises and the criteria for research grants. It promotes work on sustainable development goals, including DR, climate change, and education. However, strict eligibility criteria restrict grant accessibility based on university status, unliquidated grants/funding, researcher nationality, and experience, which may impede DR-UEC development. Moreover, CMO No. 104 aims to equip students with knowledge and skills through work experience in their chosen field. Students, universities, and collaborating enterprises benefit from such partnerships. Furthermore, CHED established a Memorandum of Understanding (MoU) with the Department of Trade and Industry in October 2020 to develop policies, standards, and guidelines for higher education advancement in the Philippines. However, there are no policies to guide the formation of DR-UECs specifically.

Instead, the emphasis is on transforming the education system to address unemployment and improve student abilities. Furthermore, UEC policies primarily target academic stakeholders, overlooking the potential benefits of DR-UECs for diverse stakeholders. This limitation impedes the progress of DR-UECs. Similarly, Sri Lankan UEC initiatives face implementation challenges, despite government efforts to enable DR-UECs.

Thailand has developed comprehensive policies for DR, highlighting several strategies, sub-strategies, and operational guidelines (Department of Disaster Prevention and Mitigation, 2015). However, there is a lack of specific policies guiding DR-UEC (National Science Technology and Innovation Policy Office, 2012).

The country reviews indicate the need for cohesive DR-UEC policies and initiatives. The Philippines focuses on DR education, Sri Lanka emphasises financial incentives, and Thailand's policies revolve around R&I. However, Thailand lacks programs supporting knowledge application or R&I for DR. Effective policy development and implementation are necessary to enable DR-UECs in all partner countries. As country reviews indicate, DR-UEC requires more funding, implementation, continuity, and long-term strategic planning, especially in DR. Moreover, the adequacy, availability, and DR relevance of partner countries' policies must be reviewed and update to ensure their efficacy for enabling DR-UECs. Policy implementation issues also arise, necessitating effective implementation strategies, particularly in DR.

DR-UEC Models

Efforts to utilise frameworks for DR-UEC are insufficient. UEC models lack depth and understanding of stakeholder dynamics, thus highlighting the need to understand the complex dynamics between stakeholders, including their roles and expected contributions to a DR collaboration. Furthermore, diversity in terms of the type and purpose of UECs needs to be

improved, as most models focus solely on economic development rather than DR. As such, universities and other stakeholders could benefit from a systematic framing of UECs in DR. This will strengthen institutional procedures and practices under the scope of a singular DR-UEC framework.

Material Barriers

Country reviews highlight the need for increased investment, venture capital, and funding to overcome barriers in DR-UECs. In Thailand, a lack of research funding hinders R&I activities, while in the Philippines, the need for early-stage investors and venture capital impedes UEC initiation. Sri Lanka also faces inadequate funding from government strategies. These funding-related barriers impact various aspects of UECs, including research partnerships, curriculum development, student mobility, and technology development, all of which are essential for DR.

Although the Thailand review did not comment, from the country reviews in the Philippines and Sri Lanka, a lack of effective marketing and promotion strategies and limited awareness of DR-UECs in universities and external enterprises were identified as barriers to DR-UECs. The Sri Lankan review highlighted the importance of universities recognising social obligations and collaborating with SMEs to achieve social impact. In some cases, social effects may be better achieved via collaborations with SMEs than larger organisations. For example, universities co-develop scientific, evidence-based programmes, government and business sectors provide resources, and SMEs implement them at the community level. The Philippines review emphasised the need for an effective marketing mechanism and clear collaboration guidelines to engage stakeholders in DR-UECs. Promoting innovation at SMEs through close networks and favourable infrastructure with universities, research institutes, and technology support centres was emphasised in both reviews as crucial for DR-UECs.

Inadequate research facilities hindered DR-UECs in the Philippines and Sri Lanka. While the Thailand review did not mention this as a barrier, it emphasised the need to develop university research facilities to facilitate collaborations for DR. The Sri Lankan review highlighted the necessity of improving university research and development facilities to support research, making universities better equipped for R&I projects in general and in the context of DR. Insufficient research facilities may deter potential partners, including enterprises and governmental agencies, from engaging in collaborative efforts with universities, as the lack of adequate facilities may compromise the quality of university capabilities.

Absorptive capacity refers to identifying, integrating and commercialising external knowledge (Cohen and Levinthal, 1990). While the Philippines and Thailand reviews did not discuss absorptive capacity, the Sri Lanka review highlighted that insufficient absorptive capacity among collaborating enterprises hinders knowledge utilisation in DR-UECs. For instance, despite advanced research activities by Sri Lankan universities to enhance flood-related risk estimation, the lack of absorptive capacity resulted in local authorities not utilising the generated knowledge. Insufficient absorptive capacity limits stakeholders' ability to assimilate and apply knowledge effectively, impeding the translation of research findings into practical applications and hindering evidence-based strategies for DR.

Material Enablers

The Philippines and Thailand reviews emphasised science and technology scholarships, university R&I funding, and financial support for collaborating enterprises as enablers of DR-UEC. In Sri Lanka, funding primarily focuses on establishing start-ups by faculty members and students rather than DR activities. Funding for DR topics is available for strategic and fundamental research across all partner countries but is often integrated with broader themes

such as health, societal, and environmental development. Researchers should align their DR research with the specific themes of funding agencies to facilitate DR-UECs.

All countries report financial grants as enablers of DR-UECs, but clarity regarding their operation is necessary, including eligibility and accessibility criteria. Grants typically involve competition, favouring larger organisations based on their capacity, resources, and investment potential. This may create unfair competition, making it essential for universities to pay attention to SMEs in DR-UECs, especially in community contexts. Involving SMEs permits local knowledge utilisation to address community needs and enhance grassroots-level DR. This approach promotes local solutions, context-specific strategies, and community-driven approaches to DR. Engaging SMEs in DR-UECs fosters inclusivity, diversifies expertise and resources, and promotes a more equitable DR-UEC landscape.

All country reviews highlighted marketing mechanisms to encourage collaboration between potential stakeholders and universities. The Sri Lankan review discussed triple tax deduction mechanisms as incentives for collaborating enterprises. The Philippines review described flexible working arrangements and financial benefits for academic staff to incentivise their engagement with UECs. The Thailand review emphasised the importance of specific policies for promoting UEC without considering their absence as a barrier to UEC. However, there were no documented specific incentives for potential stakeholders to engage with DR-UECs. By offering targeted incentives and benefits tailored to the context of DR initiatives, policymakers can attract a broader range of stakeholders to participate in DR-UECs. This can introduce different perspectives, expertise, and resources contributing to innovative DR-UECs.

Technology transfer refers to utilising available technologies for novel applications via cooperative activities between multiple stakeholders (Lane, 1999). The Sri Lankan review

emphasised technology transfer as an essential enabler in DR-UECs. Similarly, the Thailand review highlighted that knowledge and technology transfers between stakeholders are needed for innovative DR solutions. Therefore, improvements to research facilities at universities in terms of specialised research equipment, IT systems and professional supporting staff are required to facilitate the development and implementation of effective DR-UECs.

The Sri Lankan review emphasised technology transfer as an essential enabler in DR-UECs. Similarly, the Thailand review highlighted the need for knowledge and technology transfers between stakeholders for innovative DR solutions. Improvements to research facilities at universities, including specialised research equipment, IT systems, and professional support staff, are required to facilitate the development and implementation of effective DR-UECs. Although recognising inadequate facilities as a barrier to DR-UECs, the Philippines review did not consider improvements as an enabler.

Structural Barriers

One structural barrier identified in all country reviews is the lack of clear guidelines and ineffective policies governing DR-UECs, resulting in ambiguity and uncertainty for stakeholders. The Philippines and Sri Lanka review drew attention to specific government policies and initiatives, indicating the need for improved guidelines and policies regarding DR-UECs. The Thailand review highlighted unclear policies to support UEC, a lack of contribution to global R&I for DR, and community unpreparedness for disaster impacts as barriers specifically to DR-UEC.

All country reviews highlighted bureaucratic complexities in government and university procedures, hindering collaborative processes. The Philippines review noted bureaucratic regulatory processes, particularly in equipment procurement and fund disbursement. However, it also highlighted good practices in bridging funds to bypass

bureaucracy and enable UECs. While this short-term solution is commendable, a long-term approach is necessary to facilitate DR-UECs. The Sri Lanka review revealed inflexible rules and guidelines for DR-UECs, leading to slow responses to industrial demand.

Meanwhile, the Thailand review emphasised national and local government bureaucratic barriers. These barriers stem from conventional practices, a lack of adaptability, centralisation prioritisation over decentralisation, hierarchical structures, excessive paperwork, underutilisation of technology, and laborious regulations and inspections. Such barriers impede the efficiency required for successful DR-UECs. Therefore, all countries should revise their regulatory procedures to avoid bureaucracy as far as reasonably possible to make DR-UEC processes straightforward and accessible, especially for those unfamiliar with the intricate procedures.

Whilst a lack of human resource development (HRD) was only highlighted in the Thailand review as a barrier to successful DR-UECs, poor HRD results in a lack of knowledge and competencies to effectively execute DR-UECs. This results in the absence of a skilled workforce to undertake DR-UECs, which was also reported as a barrier to DR-UECs in all country reviews. As such, insufficient HRD coupled with the absence of a skilled workforce simultaneously hinders the ability to plan and execute DR-UECs.

The reviews in the Philippines and Sri Lanka highlight the lack of expertise and capacity in handling legal arrangements for intellectual property rights, contract negotiations, and the establishment of MoU and MoA, hindering DR-UEC development. The Thailand review did not identify deficient legal expertise as a barrier to DR-UECs but emphasised the need to transition from informal to formal collaborations for enabling DR-UECs. Regardless, partner countries typically rely on informal contracts for DR-UECs, which often lack specific provisions for intellectual property rights, conflict resolution, and responsibility and output

distribution. The lack of clarity and protection for intellectual property rights and challenges in negotiating fair and mutually beneficial contracts create hesitancy among potential collaborators. Insufficient expertise and capacity in legal arrangements may also cause collaboration delays and conflicts, further impeding DR-UECs.

Output-sharing issues hindered DR-UECs in partner countries. The Thailand review stressed the importance of clarity regarding industry expectations, staff capabilities, resource investment, and equitable sharing of revenue and intellectual property benefits. However, the review noted an inherent disparity due to the prevailing focus on financial outputs for enterprises and social development for non-profit stakeholders. Industries prioritise fast commercial results and short-term outcomes, while universities concentrate on basic research and academic publications, as highlighted in the Philippines and Thailand reviews. This misalignment poses challenges for collaboration, as firms seek immediate returns and clear contributions, while university researchers are motivated to publish their research results quickly.

Moreover, The Sri Lanka review raised concerns about universities' legitimate power to commercialise intellectual property rights (IPR). The University Act of 1978 primarily focuses on teaching and education, with limited provisions for research commercialisation. Consequently, the absence of clear regulations on ownership of inventions from public research and development conducted at universities and research institutes further complicates the matter. Consequently, private sector engagement and investment in DR-UECs may be deterred.

Structural Enablers

All reviews emphasised the importance of investing in human resources to develop the necessary skills to undertake UEC in general and DR contexts. HRD is considered to enable successful UECs (Vea, 2014). Specifically, the Philippines review suggested that universities

must plan and observe how faculty immersion in enterprise enables UECs. Faculty immersion can allow academics to gain more experience in enterprise to situate theory into practice by integrating approaches, theories, and methods from across disciplines (Hall et al., 2018).

The Sri Lankan review found academic staff commonly fostered university-enterprise partnerships through student internships and consultancy. Internship programs create collaborations between enterprises and universities, resulting in shared benefits (Weerasinghe and Jayawardane, 2018). For instance, recruiting trained graduates and postgraduates expands networks within academia and enterprises, facilitating the adoption of new approaches, methods, and techniques. Additionally, academic consultancy offered by university faculty can enhance long-term partnerships by better understanding enterprises' aspirations, objectives, and values. From an enterprise perspective, collaborative research activities foster innovation and the development of product prototypes, which rely on academic input.

The Thailand review also recognises HRD as an enabler of UEC and outlined several educational approaches that could be utilised for HRD, including:

- Undergraduate/postgraduate programs (e.g., M.Sc. in Disaster Analysis, Management and Mitigation by the University of Colombo, postgraduate diplomas and graduate programs for PhD students by the University of Peradeniya).
- Final projects/ dissertations (e.g., Module offered in Disaster Management under the M.Sc. in Project Management by the University of Moratuwa).
- o Continued professional development.
- o Short DR courses.

While DR education can facilitate DR-UECs, the multidisciplinary nature of DR presents a challenge for universities in preparing students for DR careers through formal curriculum delivery. Therefore, adopting a collaborative approach to curricular revisions is beneficial to ensure students possess both a theoretical understanding and practical skills required to meet entrepreneurial demands in DR (Gotangco et al., 2020). Conversely, entrepreneurs face the challenge of developing business models that effectively integrate DR investment with robust business continuity plans (Lorenzana and Sario, 2016). However, universities can contribute by researching to inform business continuity planning for DR projects.

While the Sri Lanka and Thailand reviews do not address human capital retention, the Philippines review emphasises its significance in DR-UECs. Retaining human capital fosters a culture of expertise and experience within organisations. Enhancing human capital retention cultivates specialised knowledge and skills, creating a valuable pool of expertise for future collaborations. Consequently, human capital retention supports establishing long-term professional relationships and networks, ensuring the continuity of DR-UECs.

The Philippines review highlighted the importance of developing rules, regulations, and policies for UECs to facilitate the establishment and sustainability of successful DR-UECs. Similarly, the Sri Lankan review underscored the role of universities in collaborating with the government and relevant institutions to formulate rules, regulations, and policies for UECs. Therefore, revising existing UEC policies is crucial to promote effective collaborations. However, adopting a cooperative approach among relevant stakeholders can further enhance DR-UECs by considering all stakeholders' interests in the ensuing policies.

The National Policy and Plan of Science, Technology, and Innovation No.1 (2012-2021) in Thailand highlighted the presence of unclear policies, insufficient contribution to global

research and innovation in the context of disaster resilience (DR), and unpreparedness of communities for disaster impacts as barriers specifically affecting DR-UECs. The Thailand review further explained that updated policies accommodating all stakeholders would facilitate DR-UECs. Therefore, it would benefit all countries to assess the adequacy, upgradability, availability, and relevance of their DR-UEC policies to various stakeholders, both in general and specifically for DR-UECs. Moreover, utilising policy instruments to ensure the effective implementation of DR-UEC policies can further promote the establishment and sustainability of successful collaborations (OECD, 2015; OECD., 2019).

In all country reviews, policy-related barriers related to intellectual property rights (IPR) were identified. The reviews proposed innovative strategies to address these issues. The Thailand review emphasised the need for considerations regarding intellectual property to empower collaborations, while the Sri Lankan review underscored the importance of clearly defining and enforcing rules for IPR. The Philippines review highlighted the significance of academia developing IP policies and guidelines, specifically for IP disclosures, contract arrangements, and license agreements. Implementing such measures will enable DR-UECs.

The Philippines has established IP offices (IPO) which are government agencies tasked with implementing IP policies and strengthening IP rights within the country (Cruz et al., 2021). IPOs also play a crucial role in facilitating the transition from proposal to commercialisation by offering specialised expertise (Cruz et al., 2021). Establishing IPOs has proven effective in promoting DR-UECs by addressing ownership concerns, providing updates, and enabling exclusive licenses when substantial investments of time and resources are necessary for technology commercialisation.

All country reviews emphasised the significance of clear and concise agreements in enabling DR-UECs. Such agreements, like MoUs, establish strong bonds between UECs with a high level of commitment (Alagao, 2014). This commitment cultivates trust, cooperation, and accountability, which is crucial for facilitating effective DR-UECs. Moreover, well-defined agreements encompassing elements like intellectual property rights, ownership, revenue sharing, and commercialisation processes help prevent potential conflicts related to commercialisation (Schaeffer et al., 2020). Furthermore, when promptly established, clear and concise agreements ensure commercial success and appropriate returns (Guimón, 2013).

Cultural Barriers

All reviews highlighted the lack of entrepreneurship as a barrier to DR-UECs. In Thailand, it was observed that the absence of university policies encouraging staff involvement in industry activities within collaborative initiatives hindered entrepreneurial drive. The lack of explicit support from higher education institutions and government entities limited the motivation and incentives for academic staff to engage in UECs. Similarly, the Sri Lanka review emphasised that universities' reluctance to collaborate with industry challenged the establishment of DR-UECs.

The Sri Lanka review identified several factors contributing to the lack of entrepreneurial drive among academics, including low confidence, insufficient motivation, a scarcity of entrepreneurial spirit, and a perception that collaborating with industry is beyond the role of academic researchers. Consequently, insufficient entrepreneurial drive among faculty members can impede universities' involvement in collaborating with industries for DR development. Similarly, the Philippines review emphasised that a lack of entrepreneurial drive created barriers to DR-UECs in the country. As discussed by Vea (2014), the limited interest of faculty members in UEC projects can be attributed to the cultural trait of "fear of failure"

prevalent in Filipino society. The cultural perception of avoiding failure fosters a conservative academic environment prioritising traditional research and teaching activities over UEC projects. Faculty members may perceive UECs as high-risk ventures that could divert their attention and resources from their core responsibilities. Consequently, the limited interest of faculty members in UEC projects hampers DR-UECs.

The Philippines and Sri Lanka review also highlighted the lack of interest from external stakeholders in UECs as a barrier. While the Thailand review did not mention this barrier, the Philippines review explained that the high cost associated with UECs discourages potential stakeholders. Additionally, the Sri Lanka review suggested that the excessive rates for academic expertise act as the main deterrent. In Sri Lankan universities, guidelines allocate funds to the university for its resources and facilities, resulting in minimal profit for the researcher. For instance, universities charge 46% of the total university overheads for academic consultancy. Opaque regulations further impede cost transparency (Randil et al., 2018). Consequently, this may diminish enterprise interest in DR-UECs and hinder DR initiatives.

All the country reviews highlighted heavy academic workloads as a substantial barrier to DR-UECs. Specifically, the Thailand review emphasised that DR-UECs are hindered by the constraints arising from the heavy workload of university staff and the inadequate focus on industry needs. In Thailand, the emphasis placed by university administrators on research publications and outputs often results in academic staff being prioritised for research-related responsibilities over other obligations. Similarly, the Philippines review highlighted the importance of balancing research and teaching, as current academic workloads could be more conducive to collaborative activities. In Sri Lanka, the review highlighted that the heavy academic workload faced by academic staff often leaves them with limited time to undertake

industry-related research. This constraint hinders their ability to actively participate in UECs and engage in collaborative projects with industries.

Although neither the Sri Lanka nor Thailand reviews acknowledged the role of diversity in UECs, the Philippines emphasised the lack of diversity in academic staff as a cultural barrier to DR-UECs. In the Philippines, restricting full-time professorial positions to citizens limits the introduction of diverse worldviews in classrooms (Vea, 2014). This restriction hampers the opportunity for students and academic staff to gain exposure to a broader range of perspectives and insights, including those related to DR. The absence of diverse worldviews may restrict the depth and breadth of discussions and hinder the understanding of DR issues. Furthermore, the limitation on foreign professionals in full-time positions may impact the involvement of multinational companies in R&I projects.

The reliance on mother companies for R&I initiatives indicates a potential gap in accessing external expertise and resources locally (Alagao, 2014). Without the active participation of multinational companies in DR projects, there may be missed opportunities for cross-disciplinary collaboration, technology transfer, and the application of international practices in DR. Involving diverse stakeholders and transferring knowledge from experts in relevant fields strengthens the overall understanding of DR and promotes the development of DR-UECs. Therefore, universities should consider strategies to increase diversity among academic staff and expand faculty knowledge and expertise in DR.

Cultural Enablers

Whilst the Sri Lanka review did not consider promoting research culture as an enabler of DR-UECs, both the Philippines and Thailand reviews highlighted that universities should identify viable means for promoting research culture amongst academic staff and enterprises to stem interest in DR-UECs. The Philippines and Thailand reviews suggested various

approaches to promoting research culture. These include providing financial incentives for research, upgrading facilities, and workload adjustments to accommodate research commitments. However, it is essential to note that promoting research culture in the context of DR-UECs requires a multifaceted approach beyond financial incentives and infrastructure improvements. Therefore, adopting a heuristic approach that combines different elements, such as funding, workshops, networking events, and faculty immersions, is necessary to provide opportunities for knowledge sharing, collaboration, and awareness of DR-UECs.

Whilst the Sri Lanka review highlighted heavy academic workloads as a barrier to UEC, they did not consider the re-evaluation of teaching loads for academics as an enabler of DR-UECs. The Philippines review explained that it is crucial to ensure that academics have sufficient time and resources to collaborate alongside their teaching responsibilities. The Thailand review highlighted the importance of balancing the workload of academic staff to strengthen staff capabilities for DR-UECs. Evaluating workloads will allow academics to dedicate time to DR-UECs.

Although the Philippines review did not comment on the role of university missions, objectives, and values, the Sri Lanka and Thailand review highlighted its role in enabling and facilitating DR-UECs. The Thailand review highlighted the importance of a research-focused environment in building a research culture to strengthen staff capabilities for DR-UECs. The Thailand review explained that by prioritising research and providing the necessary resources, support, and incentives, universities can create an environment that encourages DR-UECs.

As noted in the Sri Lanka review, many universities adhere to a traditional educational framework that prioritises large-scale lecture delivery to undergraduate students, particularly in job-oriented programs. While this framework effectively caters to the demand for graduates

by multinational and large organisations, it may not foster a culture of research and innovation or provide collaboration resources. Additionally, the review highlights that academics primarily engage in research activities to enhance their own profiles rather than focusing on collaborative initiatives that address societal challenges like DR. Thus, realigning resource allocation, individual academic objectives, and the broader objectives of government initiatives can facilitate DR-UECs.

Relational Barriers

All country reviews identified divergent objectives and output aspirations as a relational barrier to DR-UEC. The Sri Lanka review highlighted conflicts related to IP rights and ownership as a significant hindrance. Similarly, the Philippines review pointed out that a divergence of objectives and output aspirations among stakeholders often emerged, with enterprises prioritising fast commercial results. Likewise, the Thailand review emphasised the importance of clarity and alignment regarding industry expectations and staff capabilities as a barrier to DR-UECs. Additionally, the review identified the absence of a clear framework for the fair sharing of benefits, including revenue and intellectual property, as a further hindrance to DR-UECs.

The Philippines review highlighted that mistrust between industry and academia affects their engagement in R&D partnerships. Abendan (2017) noted industry concerns about universities stealing proprietary information, while universities are wary of industries poaching their faculty. Similarly, the Sri Lanka review emphasised the presence of mistrust between industries and universities, with enterprises expressing reservations about the university system's technical capabilities and supervisors' skills. Although the Thailand review did not address mistrust between stakeholders, it is worth noting that mistrust impedes sharing of knowledge, expertise, and resources, thereby hindering DR-UECs.

The Sri Lanka review highlighted a need for networking opportunities as a barrier to DR-UECs. The Sri Lanka review explained that there is no extant technique to collaborate with universities to enterprises rather than personal contacts retained by stakeholders. More networking opportunities must be available to allow universities and enterprises to discover and engage in potential DR-UECs. However, The Philippines and Thailand reviews did not acknowledge this relational barrier to DR-UECs.

Ineffective communication between stakeholders was also revealed as a relational barrier to UEC in the Sri Lanka review. Whilst the Philippines and Thailand reviews did not discuss effective communication, it is acknowledged that effective communication is essential for successful DR-UECs. Ineffective communication, on the other hand, can lead to misunderstandings between stakeholders regarding objectives and expectations, resulting in conflict during collaborations. Furthermore, ineffective communication can result in ineffective knowledge transfer, thus impeding DR-UECs.

Relational Enablers

All country reviews highlighted the importance of networking events for developing DR-UECs. Whilst the Thailand review highlighted networking activities as a good practice for DR-UECs, the Philippines and Sri Lanka reviews highlighted specific networking events and activities that can enable DR-UECs. The Philippines review, as discussed by Liew, Shahdan, and Lim (2013) and echoed by Vea (2014), highlights the pivotal role of networking as an enabler for successful DR-UECs. The review emphasises the importance of student internships and faculty immersion to enable academics to connect and network with professionals and practitioners outside of universities. Moreover, the Philippines review promotes their research and extension model to facilitate the transfer of knowledge and skills for DR.

Similarly, the Sri Lanka review, drawing upon the work of Wickramasinghe and Malik (2018), highlighted several mechanisms that facilitate DR-UECs. These mechanisms include academic consultancy to industry, personal networking through conferences and seminars involving industrial personnel, and part-time secondment of academic staff to industry. The review also recommends targeted partnership initiatives, such as integrating DR through corporate social responsibility and fostering grassroots-level networking for disaster management. Networking events can catalyse DR initiatives by generating interest and engagement in the field. Moreover, these events not only facilitate connections and interactions between universities and industry but also have the potential to encourage corporate social responsibility.

The Philippines review did not highlight promotion as an enabler of DR-UEC. However, both the Sri Lanka and Thailand reviews emphasised the importance of effective promotion in fostering the development of DR-UECs. The Sri Lanka review highlighted the role of government policies in promoting UECs, which included initiatives such as granting annual leave for senior academics to work in enterprises, offering tax deductions for collaborations between universities and enterprises, and funding support for UECs. However, these initiatives were not explicitly targeted at DR-UECs, and their effectiveness in promoting DR-UECs remains to be determined. Similarly, the Thailand review described government policy efforts to promote the utilisation of sciences and technologies, R&I, and budget allocation for DR. The review also emphasised using conferences, seminars, site visits, and mass media to promote and raise awareness of DR-UECs among potential stakeholders. Implementing various promotional strategies can enhance engagement with DR-UECs.

The Sri Lanka and Thailand reviews highlighted forming and maintaining collaborative networks as an enabler for DR-UECs. Sri Lanka and Thailand have implemented incubators and science parks as strategic initiatives to foster collaborative networks for DR-UECs. These

platforms assist the formation and maintenance of start-ups by professors, students, researchers, and entrepreneurs, providing them with vital support mechanisms for enterprise growth and development. Moreover, the Thailand review emphasised the importance of establishing comprehensive databases encompassing past, current, and potential stakeholders. Such databases provide a platform for identifying suitable stakeholders, aligning objectives, and fostering DR-UECs based on shared goals and necessary capabilities. However, the Philippines review did not discuss forming and maintaining collaborative networks as enablers of DR-UECs.

Although not mentioned in the Philippines review, the Sri Lanka and Thailand reviews highlighted the fair sharing of costs and benefits as enablers of DR-UECs. Establishing formal agreements that outline the equitable distribution of costs and benefits can contribute to transparency and trust among stakeholders. This promotes a sense of fairness and ensures that all parties involved in DR-UECs are appropriately incentivised and rewarded, enhancing the overall effectiveness and sustainability of DR-UECs.

Good Practices

Although all country reports highlighted several case studies to evidence good practice in DR-UECs, the Philippines report did not explicitly evidence case studies related to DR-UECs. Instead, it presented instances of good practice regarding distributing funds and establishing policies and specialised units for intellectual property regulations. On the other hand, the Sri Lanka and Thailand reviews highlighted several practical case studies in enhancing disaster mitigation and preparedness. That said, none of the partner countries evidenced cases of DR-UECs for disaster response and recovery. As such, DR-UECs should consider disaster mitigation, preparedness, response, and recovery initiatives to achieve DR across the partner countries.

658 Conclusions

This paper aimed to synthesise primary and secondary literature on DR-UECs in the Philippines, Sri Lanka, and Thailand, thus revealing considerations for improving DR-UECs in these countries. Overall, there is a need for cohesive DR-UEC policies and initiatives across all partner countries. Currently, a lack of awareness and understanding of DR-UECs, resistance to change arising from traditional academic values, and limited resources hinder the implementation and efficacy of existing policies across all partner countries. Therefore, all countries should address these challenges by ensuring policy depth and relevance to DR and providing clear guidelines to promote, guide, and regulate DR-UECs. That said, university procedures and practices should also be adopted to implement policies and enable DR-UECs.

DR-UECs are hindered by challenges in procuring specialist equipment, a lack of a clear funding process, research expertise and appropriate research facilities. As such, detailed explanations of grant/funding scopes, requirements and eligibility criteria should be accessible. Furthermore, researchers should align their DR research with scope of the funding agency to procure funding. Improvements to research facilities at universities in terms of specialised research equipment, IT systems and professional supporting staff can also facilitate the advancement of knowledge relating to DR-UECs. However, gaining knowledge alone is not enough – is it also important to consider the capacity of stakeholders to implement strategies on the back of knowledge acquisition.

Investment in infrastructure enhancement to increase absorptive capacity will enhance knowledge and technology transfer between stakeholders. Universities and enterprises should consider student and faculty immersions, research and extension, student internships, academic consultancy and curriculum development for HRD to increase absorptive capacity and enable DR-UECs. Additionally, universities should consider strategies by which they can increase diversity amongst academic staff to gain a broader range of expertise and world views to enable

DR-UECs. Policymakers should revise marketing and incentive strategies to incentivise stakeholders to conduct DR-UECs. In turn, this will facilitate the engagement of a broader range of stakeholders to formulate innovative solutions to various aspects of DR.

There are steps that universities and other stakeholders can take to facilitate positive stakeholder relationships to mitigate any mistrust and prevent disputes that may arise in a DR-UEC. Formal agreements can be established before the collaboration begins. Further, the development and implementation of IP rights/ownership legislation will ensure the fair sharing of benefits that arise from collaborative DR projects. Furthermore, policymakers should revise regulatory procedures to avoid bureaucracy to simplify DR-UEC processes, especially for those unfamiliar with the procedures involved. Although each partner country highlighted examples of several successful UECs, future research is needed to understand the strength and reach of collaborative networks for DR initiatives in the partner countries.

While successful UEC examples exist, further research is needed to understand the strength and scope of collaborative networks in DR initiatives. Empirical research is necessary to explore the practical application and feasibility of identified barriers and enablers in real-world contexts. Integrating theoretical and practical perspectives can lead to the development of a comprehensive heuristic framework that guides the initiation and sustenance of successful DR-UECs. This framework will encompass theoretical enablers, barriers, good practices, and a practical understanding of initiating and maintaining successful DR-UECs. It can serve as a valuable tool to inform the process of initiating and maintaining successful DR-UECs.

1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	
18	
19	
20	
21	
22	
23	
24	
25	
26	
27	
28	
29	
30	
31	
32	
33	
34	
35	
36	
37	
38	
39	
40	
41	
42	
43	
44	
45	
46	
47	
48	
49	
50	
51	
52	
53	
54	
55	
56	
57	
58	

} !	703	
, ,	704	References
, 3)	705 706	Abendan R (2017) Establishing Industry-Academe Linkages: The STRIDE Experience [PowerPoint Slides].
0 1 2 3 4 5	707 708 709 710	Adarlo G and Jackson L (2016) For whom is K-12 education: A critical look into twenty-first century educational policy and curriculum in the Philippines. In: Anonymous <i>Educating for the 21st Century: Perspectives, Policies and Practices from Around the World.:</i> Springer, 207-223.
6 7 8 9	711 712 713	Alagao F (2014) Industry Academe Collaboration for Research. he MSU-IIT Experience. Appendix of Vea, R. B. (2014). Industry-academe collaboration for research and development (No. 2014-10). <i>PIDS Discussion Paper Series.</i>
21 22 23	714 715	Ankrah S and Al-Tabbaa O (2015) Universities–industry collaboration: A systematic review. <i>Scandinavian Journal of Management</i> 31(3): 387-408.
14 15 16 17	716 717	Asian Preparedness Partnership (2021) Landscape Analysis Report on Innovation for Disaster Risk Management in Asia.
28 29 30 31 32	718 719 720	Awasthy R, Flint S, Sankarnarayana R and Jones RL (2020) A framework to improve university–industry collaboration. <i>Journal of Industry-University Collaboration</i> 2(1): 49-62.
3 34 35	721 722	Brillantes AB, Brillantes KDB and Jovellanos JBB (2018) No title. <i>Process Evaluation of the CHED K to 12 Adjustment Assistance Program.</i>
86 87 88 89	723 724	Bullock JA, Haddow GD and Coppola DP (2012) Mitigation, Prevention, and Preparedness. <i>Introduction to Homeland Security</i> : 435-494.
10 11 12	725 726	Burke Rolfhamre L (2019) Patterns of interorganizational collaboration in disaster risk reduction: Evidence from Swedish municipalities.
13 14 15 16 17	727 728 729	Buys N and Bursnall S (2007) Establishing university–community partnerships: Processes and benefits. <i>Journal of Higher Education Policy and Management</i> 29(1): 73-86.
18 19 10	730 731	Cabalfin MR, Mallari RBC and Orbeta AC (2019) No title. <i>Impact Evaluation Design for the CHED K-to-12 Transition Program</i> .
51 52 53 54	732 733	Calderon MTF (2015) A critique of K-12 Philippine education system. <i>Arellano University Graduate School Journal</i> 12(1): 1.
55 56 57	734 735	Cohen WM and Levinthal DA (1990) Absorptive capacity: A new perspective on learning and innovation. <i>Administrative Science Quarterly</i> : 128-152.
i8 i9 i0	736 737	Cruz CE, Ting KAI and Tenido PID (2021) Assessing IPR protection in the semiconductor and electronics industry in the Philippines: Challenges and opportunities in the global

- value chain. Intellectual Property Rights and ASEAN Development in the Digital Age: 114-
- 739 143.
- 740 Department of Disaster Prevention and Mitigation (2015) *National Disaster Risk*
- *Management Plan.* Bangkok.
- 742 Etzkowitz H and Zhou C (2017) The Triple Helix: University-industry-government
- *Innovation and Entrepreneurship.:* Routledge.
- Gotangco CK, Jardeleza JM, Lopez C, Labaria EC, Wickert J and Shadiya F (2020) Factors
- influencing disaster risk and resilience education in Asian HEIs. *International Journal of*
- 746 Disaster Resilience in the Built Environment.
- Guimón J (2013) Promoting University-Industry Collaboration in Developing Countries
- 748 (Innovation Policy Platform, OECD and World Bank).: Unpublished.
- 749 Hall KL, Vogel AL, Huang GC, Serrano KJ, Rice EL, Tsakraklides SP, et al. (2018) The
- 750 Science of Team Science: A Review of the Empirical Evidence and Research Gaps on
- 751 Collaboration in Science. *The American Psychologist* 73(4): 532-548.
- 752 Hermosura JB (2019) Fostering Human Capital Development through the Triple Helix
- 753 Model of Innovation: Cases from Selected Local Colleges and Universities (LCUs) in Metro
- 754 Manila.
- 755 Kaklauskas A, Amaratunga D, Haigh R, Binkyte A, Lepkova N, Survila A, et al. (2018) A
- model and system for an integrated analysis of the iterative life cycle of university-
- industry partnerships. *Procedia Engineering* 212: 270-277.
- Kong E (2013) Strategic trisector collaboration in disaster response. *World Review of*
- *Business Research* 3(2): 127-140.
- Lane JP (1999) Understanding technology transfer. *Assistive Technology* 11(1): 5-19.
- Larsen K, Bandara DC, Esham M and Unantenne R (2016) *Promoting University-Industry*
- 762 Collaboration in Sri Lanka: Status, Case Studies, and Policy Options.: World Bank
- 763 Publications.
- Liew MS, Shahdan TT and Lim ES (2013) Enablers in enhancing the relevancy of
- university-industry collaboration. *Procedia-Social and Behavioral Sciences* 93: 1889-
- 766 1896.
- Lorenzana EA and Sario AA (2016) Framework of collaboration of Disaster Risk
- 768 Reduction Stakeholders towards Resilient Communities.
- Moeliodihardjo BY, Soemardi BW, Brodjonegoro SS and Hatakenaka S (2012)
- 770 University, industry, and government partnership: Its present and future challenges in
- 771 Indonesia. *Procedia-Social and Behavioral Sciences* 52: 307-316.

- National Science Technology and Innovation Policy Office (2012) *National Science*
- 773 Technology and Innovation (STI) Policy and Plan. Available at:
- 774 http://www.sti.or.th/sti/encontent.php?content_type=3.
- Navarro RL (2018) University-Industry Collaboration in the Philippines.
- 776 OECD (2015) Enquiries into Intellectual Property's Economic Impact.
- 777 OECD. (2019) University-Industry Collaboration New Evidence and Policy Options.: OECD
- 778 Publishing.
- Office of the National Economic and Social Development Board (2017) *The Twelfth*
- 780 National Economic and Social Development Plan (2017-2020). Available at:
- 781 https://www.oneplanetnetwork.org/sites/default/files/thailand_national_economic_an
- 782 <u>d_social_development_plan_nesdp.pdf.</u>
- Randil C, Jayasiri G, Perera C, Siriwardana C, Liyanage C, Hettiarachchi SSL, et al. (2018)
- Need for strong university-industry partnerships: a case study in Sri Lanka. *MATEC Web*
- *of Conferences* 229: 4002.
- 786 Schaeffer V, Öcalan-Özel S and Pénin J (2020) The complementarities between formal
- and informal channels of university–industry knowledge transfer: a longitudinal
- approach. *The Journal of Technology Transfer* 45(1): 31-55.
- Schiller D and Diez JR (2007) University-industry linkages. *Special Feature: The Triple*
- *Helix Model for Innovation*: 38-44.
- 791 Sevilleja R (2014) Industry-Academe Collaboration for Research: The CLSU
- Experience Appendix of Vea, R. B. (2014). Industry-academe collaboration for research
- and development (No. 2014-10). PIDS Discussion Paper Series.
- 794 Singh A and Prakash G (2010) Public-private partnerships in health services delivery: A
- 795 network organizations perspective. *Public Management Review* 12(6): 829-856.
- 796 Symaco LP and Bustos MTA (2021) Overview of Education in the Philippines.
- 797 International Handbook on Education in South East Asia: 1-27.
- 798 Tantanee S, Buranajarukorn P and Apichayakul P (2018) University-Industry Linkages
- in the Disaster Resilience Sector: A Case Study of Thailand. *Procedia Engineering* 212:
- 800 519-526.
- Tantanee S, Apichayakul P, Buranajarukorn P, Pardthaisong L, Suwanprasit C,
- 802 Charoenpanyanet A, et al. (2019) Policies to Promote Research and Innovation in
- 803 Developing Countries' Universities: The Case of Thailand. *Indian Journal of Public*
- *Administration* 65(3): 718-732.
- Vea RB (2014) No title. *Industry-Academe Collaboration for Research and Development.*

Webster J and Watson RT (2002) Analyzing the past to prepare for the future: Writing a literature review. MIS Quarterly: xiii-xxiii.

Weerasinghe RN and Jayawardane AK (2018) University-Industry Partnerships for Innovation: Sri Lankan Experiences. Annals of Spiru Haret University, Economic Series 9(1): 25-45.

and Malin cry perspect. J4): 1850032. Wickramasinghe V and Malik K (2018) University-industry collaboration in Sri Lanka— A developing country perspective. *International Journal of Innovation and Technology* Management 15(04): 1850032.

Table I. Policies and initiatives for UEC in each partner country

Country	Policy	Purpose and summary
Philippines	Philippine Qualifications Framework (PQF)	To benefit various sectors and stakeholders of education and training to develop lifelong learners, provide employers with specific training standards and qualifications aligned to industry standards, and ensure that training and educational institutions adhere to specific standards and are accountable for achieving the same.
	Memorandum of Understanding with the Department of Trade and Industry (DTI) (2020)	Intends to develop policies, standards, and guidelines for advancing higher education in the Philippines. This partnership also signifies the common goal of DTI and Commission on Higher Education (CHED) of advocating quality and performance excellence in tertiary education in the country.
	CMO Number 104 series of 2017	Stipulates the revised procedures for conducting student internship programs. Specifically, the guidelines aim to fully equip students with knowledge and skills by letting them experience their field of work.
	CMO No.14 series of 2016	Allows teachers affected by curriculum change to apply for a Sectoral Engagement Program, whereby teachers can work full-time or part-time in the industry of their expertise. When their applications are successful, teachers can enjoy a reduced working scheme with financial assistance from CHED and enhance their skills and knowledge in their fields.
	CMO No.52 series of 2016	Guides the implementation of research and development (R&D) and extension programs of universities and their venture with their industry partners and describes the benefits universities and Industry partners can enjoy. It encourages work on different sustainable development goals such as food production and security, environment, disaster risk reduction, climate change, energy, terrestrial and marine, resources: economy, biodiversity, and conservation, smart analytics and engineering innovations, health systems and education for STEAM (Science, Technology, Engineering, Arts & Mathematics).
	In 2015, the most recent initiative presented by UGC granted funding for university enterprise collaborations.	Encourage innovations and research in pure sciences, research that directly impacts society; post-doctoral researchers for academics who just finished their PhDs; national and international training programs for academic staff in the university and the facilitation of loans having favourable terms and conditions for academic staff to commercialise products that advanced through research and development.
Sri Lanka	In 2014, the Sri Lankan government introduced enterprises' triple tax deduction mechanism.	To encourage enterprises to engage with UECs resulting in the development of formal units committed to UECs at the Open University of Sri Lanka, the University of Kelaniya and the University of Colombo.
	The Sri Lankan government began to support university enterprise collaboration from 2005	University grants commission (UGC) announced the circular granting annual leave for senior university academics to work officially in any enterprise.

Table I. continued

Country	Policy	Purpose and summary
Thailand	12th National Economic and Social Development Plan 2017-2021 (Office of the National Economic and Social Development Board, 2016)	To promote research and development, foster intelligent technology, and develop technopreneurs' skills. It aims to increase connectivity between major production sectors, small and medium enterprises (SMEs), research institutes and the academic sector. Development strategies are encouraged to support collaborative working networks between research institutes, the academic, public and private sectors, and citizens to develop social innovations.
	0,50	
		isaster Resilience in the Built En

3/Journal of Disaster Resilience in the Built En

Ta.	ble	V.	Continue

Country	Case Studies	Purpose
	Community and infrastructure resilience through a strategy by the University of Peradeniya, DMC and UNDP.	Development of Macro Seismic Hazard Zonation
	collaboratively with DMC and UNDP	Preparing communities and infrastructure for future natural disasters by proposing suitable locations for disaster evacuation centres determined by using past disaster experiences of the communities
Sri	The University of Peradeniya collaboratively with DMC and UNDP.	Structural stability improvement project of temporary evacuation centres
Lanka		A Flagship program commenced by the university of Ruhuna, and the University of Moratuwa, along with the plantation ministry and Dialog Axiata PLC, to upgrade the protected Agriculture sector of the country by introducing climate smart Agriculture program, introducing auto controlling mechanism for environmental and fertigation control systems connected through IoT platform. In collaboration with the University of Central Lancashire, the Ministry of Social welfare and Primary Industries (MoSWPI) has initiated a program to develop a platform to facilitate University-Industry partnerships.
	Chiang Mai University (CMU) also has closely collaborated with the industries.	Promote development in innovative environment and energy; food and health; adult caring; creative Lanna; producing graduates who have morals, quality and skills to be a citizen of the world; conducting research for excellence and innovation; academic services that are beneficial for society; revenue for sustainable development and integrated management.
	Centre of Excellence in Natural Disaster Management	Research centre focused on conducting research in disaster management.
Thailand	Research collaboration among four universities of Mahasarakham University (MSU), King Mongut's University of Technology North Bangkok (KMUNT), Nakhon Panom University (NPU),	Development of Cylindrical Drum Drying Technology with Infrared Radiation in Combination with Hot Air Discharges
	Rajamangala University of Technology Isan Khon Kaen Campus (RMUTi Khon Kaen), the government agency of Internal Security	Dan Sai Municipality and aimed to evaluate the city's greenhouse gas emissions
	Operations Command (ISOC) and industry of Arthit Machinery Co., Ltd. GHG Evaluation and Mitigation Planning for Low Carbon City	Implemented the "Fire Forest Protection and Control by Small Drone Aircraft, Checking Fire Hot Spots" project. This project aimed to monitor fire hot spots in Mae Cham District, Chiang Mai Province

Case Study

Table V. Continued

Chiang Mai University's Geoinformatics Regional Space and Technology Center of Northern Thailand, Faculty of Social Sciences, together with the National Defence Technology Institute

Thailand

UEC involving academic, government, private, and local community sectors.

The haze Pollution in Chiang Mai Project aimed to investigate the building resilience of Chiang Mai during the past ten years, between 2007 and 2016. The villagers' and communities' perceptions and coping strategies in the most affected areas are also examined. sti. **Table II.** Models for UEC in each partner country

Country	Model	Description
	Triple Helix Model	Highlights interactions between academia, industry and government to promote economic and social development.
	Triple Helix Model for Human Capital Development	Elucidates the interactions between universities, government, and industries for economic and social development and practical suggestions to encourage successful collaborations.
	Student Internship Model	Promotes student internship programs or on-the-job training (OJT) courses and work with industry partners to provide opportunities for students to acquire and deepen their most relevant competencies for employment.
Philippines	Faculty Immersion Model	Encourages researchers and professional practitioners in academia to engage with enterprise projects that will enhance their knowledge and skills in their specialist fields.
	R&D Model	Supports the engagement of university faculties in R&D endeavours to facilitate the discovery of new knowledge, integrate theories and skills across disciplines, apply relevant knowledge, and implement responsive curricula.
	Research and Extension Model	Promotes activities that allow the transfer of knowledge, skills, and technology generated from academic research to the broader community.
Sri Lanka	Triple Helix Model	Highlights interactions between academia, industry and government to promote economic and social development.
Thailand	UEC Model	Emphasises strengthening existing competitive production and service sectors to become more technology-intensive and innovation-driven by transferring knowledge from research or academic institutions.
		BUILT

Table III. Summary of barriers to UEC in the partner countries.

	•		Country	
Category	Barrier	Philippine s	Sri Lanka	Thailand
	Lack of investment/venture capital/ funding opportunities.	X	X	X
	Lack of marketing, promotion and awareness of UEC.	X	X	
3.6 / 1.1	Lack of adequate research facilities.	X	X	
Material	Inadequate absorptive capacity.		X	
	Lack of infrastructure, mechanisms and supporting systems for initiating and maintaining	W	37	v
	collaborations.	X	X	X
	Lack of clear guidelines and ineffective policies regarding UEC.	X	X	X
	Bureaucracy in government and university procedures (e.g. procurement of equipment, liquidation of	X	X	X
	funding, contract development).	71	24	
Structural	Lack of human resource development.			X
	Absence of a skilled workforce to undertake UECs.	X	X	X
	Limited expertise and capacity for legal arrangements (e.g. IP rights, contracts, MoU, MoA).	X	X	
	Output sharing issues (e.g. unfair sharing of IP, patents and publications).	X	X	X
	Lack of interest in UECs amongst academic staff.	X	X	X
	Lack of established research culture.	X	X	X
	Lack of diversity in academic staff.	X		
Cultural	Heavy academic workloads.	X	X	X
Cultului	Lack of interest in UECs from businesses/organisations.	X	X	21
	Academic researchers charging excessive rates.	71	X	
	Divergence of objectives between stakeholders, along with competing priorities of academics.	X	X	X
	Divergence in output aspirations.	X	X	X
	Mistrust between universities and enterprises	X	X	
Relational	Lack of networking opportunities.	X	X	
	Ineffective communication between universities and potential collaborators.		X	

Table IV. Summary of enablers of UEC in the partner countries

Category	Enablers -	Country		
		Philippines	Sri Lanka	Thailand
	Scholarships, grants and funding	X	X	X
	Sufficient budgets	X		X
	Incentives for stakeholders to engage with UEC	X	X	
Material	Relevant and functional equipment and research facilities	X	X	X
	Technology transfer	X	X	X
	Infrastructure to facilitate UEC (e.g. centralised admin, IT systems)	X	X	X
	Human capital development	X	X	X
	Faculty immersion	X	X	
	Curricular revisions (e.g. DR courses, industrial internships etc.)	X	X	X
Structural	Relevant training courses (e.g. undergraduate, postgraduate and CPD)	X		X
Structurar	Human capital retention	X		
	Appropriate legal frameworks and policies	X	X	X
	Effective framework/policy implementation			X
	Clear and concise contracts (i.e. MoU, MoA)	X	X	X
	Promotion of research culture among academic staff	X		X
	Re-evaluation of teaching loads for academics (e.g. allocated time for UEC,	N/		37
G 1, 1	reduced teaching loads)	X		X
Cultural	Clarification of university missions, objectives and values (i.e. research-		37	37
	focus, teaching-focus		X	X
	Networking events	X	X	X
	Promotion of UEC (e.g. conferences, seminars, site visits and mass media)		X	X
	Formation and maintenance of collaborative networks (i.e. a database of			
Relational	previous, current and potential collaborators, interaction channels, i.e.		X	X
	science parks and incubators).			
	Fair sharing of costs and benefits		X	X
	This comming of tooks man contains		4-	

Table V. Summary of good practices to UEC in the partner countries.

	Case Studies	Purpose	DR Aspect
	Formation of The UPLB Foundation Inc. (UPLB FI)	Performs services related to project development, implementation, monitoring and evaluation and has signed a memorandum allowing its access to UPLB's facilities and experts. Between 2005 and 2009, UPLBFI administered research funds totalling PhP 700M compared with only PhP 300M for central administration and provided bridging funds for projects whose disbursements were delayed.	Regulatory processes
hilippines	The triple helix partnership between the College of Management in the University of the Philippines Visayas, the Province of Capiz and Roxas City (Government), and Pueblo de Panay, Inc. (Industry), a real estate developer.	This arrangement was envisioned to provide continuing, long-term developmental solutions to jumpstart the economic development of Roxas City.	Establishing IPOs and reviewing IP policies
	The establishment of an IP Office (IPO)	The IPO can negotiate and resolve questions of IP ownership and facilitate the process from proposal review to commercialisation of products, which requires specific expertise and capacity for legal arrangements. The IPO also provides seminars and workshops on IP.	Establishing IPOs and reviewing IP policies
	Disaster Management Centre consultancy and state universities	To consult Universities on the planning of coastal hazard analysis, Tsunami deluge guides and improvement of drought hazard studies.	Disaster Mitigation
	National Building Research Organization, Ministry of Disaster Management and the University of Moratuwa	Consultation projects for national development.	Disaster Mitigation
Sri Lanka	Irrigation Department The Irrigation Department launched Climate Resilience Improvement Project (CRIP)Irrigation Department launched Climate Resilience Improvement Project (CRIP) with the collaboration of the Mahaweli Authority, Disaster Management Centre, governmental organisations, the University of Moratuwa and diverse	Improve climate resilience	Disaster Preparedness

through a syrtalledy the Mobile by the University Laborates	Communications	DevelopinentevolopMacroisSetismEurlyHWzardngZonatrionk (toEWoN)mthnitius rand a	al Disasterminingtion wasterreddied wes
UNDP. of Moratuwa (UOM)	aydh Di Meivarrity	infrastruentye for fatire matural disasters by proposing suitable locations for disaster evacuation centres determined by using past disaster experiences of the communities	and Preparedness
The University of Mometeorological departs	oratuwa with the ment	Structural subitly improvement follower to the period to the service of the servi	Disaster prepared Possastard Veripoline
		A Flagship program commenced by the university of Ruhuna, and the	Disaster preparedness
with the Wildlife Con The University of Peradeniya	servation Society	introducing climate smart Agriculture program, introducing auto controlling	in elephant guard Disaster Preparedness
condocatively with Divice and	d ONDI.		
			Disaster Mitigation
		develop a platform to facilitate University-industry partnerships.	Disaster Mitigation
		Promote development in innovative environment and energy; food and health; adult caring; creative Lanna; producing graduates who have morals, quality and skills to be a citizen of the world; conducting research for excellence and innovation; academic services that are beneficial for society; revenue for sustainable development and integrated management.	Disaster Mitigation
Centre of Excellence in N Disaster Management	Vatural	Research centre focused on conducting research in disaster management.	Disaster Mitigation
			Disaster integration
	The University of Mowith the Wildlife Consorting The University of Mowith the Wildlife Consorting The University of Mowith the University of Mowith DMC and Chiang Mai University (Chiang Mai University (Chia	The University of Moratuwa, together with the Wildlife Conservation Society The University of Moratuwa, together with the Wildlife Conservation Society The University of Moratuwa, together with University and University and University Conservation Society Collaboratively with DMC and UNDP. Chiang Mai University (CMU) also has closely collaborated with the industries. Centre of Excellence in Natural	The University of Moratuwa, together with the Wildlife Conservation Society The University of Regradentya collaboratively with DMC and UNDP. A Flagship program commenced by the university of Ruhuna, and the University of Moratuwa, along with the plantation ministry and Dialogs Axiata Pf.C. to upgrade the protected Agriculture sector of the country by introducing climate smart Agriculture program, introducing auto controlling mechanism for environmental and fertigation control systems connected through IoT platform. In collaboration with the University of Central Lancashire, the Ministry of Social welfare and Primary Industries (MoSWPI) has initiated a program to develop a platform to facilitate University-Industry partnerships. Chiang Mai University (CMU) also has closely collaborated with the industries. Promote development in innovative environment and energy; food and health; adult caring; creative Lanna; producing graduates who have morals, quality and skills to be a citizen of the world; conducting research for excellence and innovation; academic services that are beneficial for society; revenue for sustainable development and integrated management.

	D. A. L. W. L. anti- a annua	Development of Calindrial Development Technology with Leftered	Discrete Description
	Research collaboration among universities of Mahasarakham Universit, King Mongut's University of Technology North Bangkok, Nakhon Panom Universit, Rajamangala University of Technology Isan Khon Kaen Campus, the government agency of Internal Security Operations Command and industry of Arthit Machinery Co., Ltd.	Development of Cylindrical Drum Drying Technology with Infrared Radiation in Combination with Hot Air Discharges	Disaster Preparedness
	Chiang Mai University's GISTNORTH (Geo – informatics Regional Space and technology Centre of Northern Thailand), Faculty of Social Sciences together with the National Defence Technology Institute	Implemented the "Fire Forest Protection and Control by Small Drone Aircraft, Checking Fire Hot Spots" project. This project aimed to monitor fire hot spots in Mae Cham District, Chiang Mai Province	Disaster Mitigation
	GHG Evaluation and Mitigation Planning for Low Carbon City Case Study	Dan Sai Municipality and aimed to evaluate the city's greenhouse gas emissions	Disaster Mitigation
Thailand	Chiang Mai University's Geoinformatics Regional Space and Technology Centre of Northern Thailand, Faculty of Social Sciences, and the National Defence Technology Institute	The haze Pollution in Chiang Mai Project aimed to investigate the building resilience of Chiang Mai during the past ten years, between 2007 and 2016. The villagers' and communities' perceptions and coping strategies in the most affected areas are also examined.	Disaster preparedness

Sources Included in Country Reviews	Document Type
Abendan, R. (2017). Establishing Industry-Academe Linkages: The STRIDE Experience [Powerpoint Slides] National Research Innovation and Extension Conference.	Grey Literature
Alagao, Feliciano. <i>Industry-Academe Collaboration for Research: The MSU-IIT Experience</i> . Appendix of Vea, R. B. (2014). Industry-academe collaboration for research and development (No. 2014-10). PIDS Discussion Paper Series.	Grey Literature
Asian Disaster Preparedness Centre (ADPC). (2008). Disaster Management Information Link Report. Comprehensive Disaster Management Programme. Support for a Disaster Management Information Network (DMIN). Available at: https://www.preventionweb.net/files/22229 22229 dminseriesreport1dminfolinkrep.pdf.	Grey Literature
Bangkok Post. (2018). 20-year National Strategy comes into effect. Bangkok Post Online, 13 October 2018. Available at: https://www.bangkokpost.com/thailand/general/1557462/20-year-national-strategy-comes-into-effect.	Grey Literature
Buranajarukorn, P., Tantanee, S., Apichayakul, P. (2017). The Enablers that Support Research & Innovation in University. <i>Proceedings of ASAIHL 2017 Conference</i> , Naresuan University. 1-3 November 2017.	Grey Literature
Business & Technology Development Strategies LLC. (2001). Ruhuna Business Incubator: Feasibility Assessment and Business Plan Study. United Nations Industrial Development Organization, Vienna, Austria. Available at: https://open.unido.org/api/documents/ 4683121/download/(R)%20SRI%20LANKA.%20RUHUNA%20BUSINESS%20INCUBATOR%20- %20FEASIBILITY%20ASSESSMENT%20AND%20BUSINESS%20PLAN%20STUDY %20(22647.en)	Grey Literature
Champika, L., Evangelia, P., Maruf, R., Jörgen, S., and Sarintip, T. (2019, January). UIPs in Thailand, Sri Lanka, and Bangladesh: A Relational Approach. 07.	Grey Literature
CHED K to 12 Transition PMU (October 5, 2017). CHED Strengthens Academe-Industry Collaboration through Faculty Immersion [Blogpost]. Available at: https://chedk12.wordpress.com/2017/10/05/ched-strengthens-academe-industry-collaboration-through-faculty-immersion/#:~:text=CHED%20Strengthens%20Academe%2DIndustry%20 Collaboration%20through%20 Faculty%20Immersion,-October%205%2C%202017&text=According%20to%20CHED%20 Chairperson%20Patricia,the%20private%20and%20public%20sectors	Grey Literature
Choy, S. and Delahaye, B. (2009) University-industry partnership for pedagogy: some principles for practice. <i>Proceedings of the 16th World Association for Cooperative Education Conference</i> , June 23-26, 2009, Vancouver, Canada.	Grey Literature
Community Partnership and Extension Office (2016). PNU Extension Manual. PNU University Press Philippines.	Grey Literature
Hermosura, J. (2019). Fostering Human Capital Development through the Triple Helix Model of Innovation: Cases from Selected Local Colleges and Universities (LCUs) in Metro Manila. <i>Iapa Proceedings Conference</i> , pp.788-814. doi:10.30589/proceedings.2019.264	Grey Literature
Jayaisiri, G., Siriwardena, C., Hettiarachchi, S., Dissanayake, R., & Bandara, C. (2018). Role of higher education institutes in coastal community resilience & risk management. 8th International Conference on Building Resilience – ICBR Lisbon' 2018.	Grey Literature
Jayasekera, G. S. K. W., Weerasinghe, K. D. N., Champika, L., and Bandula, W. (2019). Policy Environment to Promote University-Industry Partnerships and Business Incubation Programs in Sri Lanka. Book of abstract and proceedings of the International Conference on Capacity Building for Research and Innovation in Disaster Resilience. Sri Lanka. 14-18 January 2019.	Grey Literature
National Disaster Prevention and Mitigation Committee. (2015). National Disaster Risk Management Plan. Bangkok: Department of Disaster Prevention and Mitigation, Ministry of Interior. Available at: 54086_54086thailandsnationaldrmplan2015.pdf.	Grey Literature
Navarro, R. (2018). University-Industry Collaboration in the Philippines. Retrieved from https://nanopdf.com/download/dr-rosita-l-navarro-president-of-centro-escolar-university_pdf#	Grey Literature
Office of the National Economic and Social Development Board, Office of the Prime Minister. (2016). The 12th National Economic and Social Development Plan. Available at: https://data.thailand.opendevelopmentmekong.net/dataset/12/resource/221befc5-3058-402a-9d31-279ac5bb a4ec. (in Thai)	Grey Literature
Preparedness Using Past Experience. International Conference of the International Institute for Infrastructure Renewal and Reconstruction (IIIRR), Brisbane, Australia.	Grey Literature
Randil, C., Jayasiri, G., Perera, C., Siriwardana, C., Liyanage, C., Hettiarachchi, S. S. L., & Haigh, R. (2018). Need for strong university-industry partnerships: A case study in Sri Lanka. MATEC Web of Conferences. Available at: https://doi.org/10.1051/matecconf/201822904002	Grey Literature
Sevilleja, Ruben. Industry-Academe Collaboration for Research: The CLSU Experience. Appendix of Vea, R. B. (2014). <i>Industry-academe collaboration for research and development (No. 2014-10)</i> . PIDS Discussion Paper Series.	Grey
Smith, D., and Katz, J. S. (2000). Collaborative approaches to research. A report to the Higher Education Funding Council for England. Centre for Policy Studies in Education, University of Leeds. ISBN 0, 85316, 214.	Grey Literature

Thakore, R. and Liyanage, C. (2016). Data analysis and research findings of the survey questionnaire. Advancing Skill Creation to Enhance Transformation (ASCENT) project. Erasmus+Programme of the European Union. 18 October 2016.	Grey Literature
Thirlway, C. (2020). Climate Change: The time to act is now. WIPO Magazine. March 2020. Available at: https://www.wipo.int/wipo_magazine/en/2020/01/article_0001.html.	Grey Literature
United Nations Industrial Development Organization (UNIDO). (2003). RUHUNA BUSINESS INCUBATOR IN SRI LANKA. A boost to southern entrepreneur development. Available	Grey
at: https://www.yumpu.com/en/document/read/23064956/ruhuna-business-incubator-in-sri-lanka-a-boost-unido	Literature
University of Peradeniya. (n.d.). University of Peradeniya. International Relations Office. Available at: https://inro.pdn.ac.lk/index.php.	Grey
	Literature
Udomsopagit, S. (2016). Open Innovation. <i>Technology Promotion and InnoMag Magazine</i> . Vol.42, No.244. pp.57-60.	Grey Literature
Vea, R. B. (2014). Industry-academe collaboration for research and development (No. 2014-10). PIDS Discussion Paper Series.	Grey
	Literature
Weerasinghe, R. N., & Jayawardane, A. K. W. (2018). University-Industry Partnerships for Innovation: Sri Lankan Experiences. (1), 6–13.	Grey Literature
Weththasinghe, K. K., Gajendran, T., & Brewer, G. (2016, July). Barriers in Proper Implementation of Public Private Partnerships (PPP) in Sri Lanka. 858–869. Available at: https://espace.library.uq.edu.au, accessed on 30/04/2021.	Grey Literature
Wickramasinghe, V., & Malik, K. (2016). Exploring motivations for university industry collaboration in Sri Lanka. R&D Management Conference 2016 "From Science to Society: Innovation and Value Creation."	Grey Literature
Moeliodihardjo, B.Y., Soemardi, B.W., Brodjonegoro, S.S. and Hatakenaka, S. (2012). Industry, and Government partnership: its present and future challenges in Indonesia. 10th Triple Helix Conference 2012	Grey Literature
Liyanage, C., McDonald, R., Amaratunga, D., and Haigh, R.P. (2020). University-industry partnership (UIPs) for research and innovation in disaster resilience. in Theme Seminar 2020 Sri Lanka Association for the Advancement of Science. Available at: https://www.researchgate.net/publication/348408598_University-Industry_Partnerships_UIPs_for_Research_and_Innovation_in_Disaster_Resilience.	Grey Literature
The University of the Philippines Los Banos Experience. Appendix of Vea, R. B. (2014). <i>Industry-academe collaboration for research and development (No. 2014-10)</i> . PIDS Discussion Paper Series.	Grey Literature
Weerasinghe, R.N. (2020 Unpublished). Assessment of the National Innovation System of Sri Lanka. PhD Thesis submitted to University of Moratuwa for Doctor of Philosophy Program, Department of Management of Technology, Sri Lanka.	Grey Literature
Agero, A.D., & Bonotan, A. M. (2016). Academe-Industry Partnership: Basis for Enhanced Learning Guide in the New Science General Education Course. <i>Asia Pacific Journal of Multidisciplinary Research</i> , 4(4).	Journal Article
Al-Shehri, A., Drew, S., Alfarraj, O. (2012). A Comprehensive Analysis of E-government services adoption in Saudi Arabia: Obstacles and Challenges. International Journal of Advanced Computer	Journal
Science and Applications. 3(2), pp.1-6.	Article
Auzzir, Z.A., Haigh, R. P., and Amaratunga, D. (2014). Public-private partnership (PPP) in disaster management in developing countries: a conceptual framework. <i>Propedia Economics and Finance</i> 18, pp.807-814 Available at: https://www.sciencedirect.com/science/article/pii/S2212567114010065.	Journal Article
Azman, N., Sirat, M., Pang, V., Lai, Y.M., Govindasamy, A.R. and Din, W.A. (2019). Promoting university–industry collaboration in Malaysia: stakeholders' perspectives on expectations and impediments. <i>Journal of Higher Education Policy and Management</i> . Vol.41, Issue.1, pp.86-103.	Journal Article
Bernarte, R. P. (2014). Academe-Industry Partnership in the Philippines: Nature, Benefits, and Problems. Asia Pacific Higher Education Research Journal (APHERJ). 1(1).	Journal Article
Brennan, J., Cochran, A., Lebeau, Y., and Williams, R. (2018). The University in its Place: Social and Cultural Perspectives on the Regional Role of Universities. Netherlands: Springer.	Journal Article
Brimble, P. and Doner, R. (2007). University–Industry Linkages and Economic Development: The Case of Thailand. World Development. 35(6), pp. 1021-1036.	Journal Article
Cai, Y. and Etzkowitz, H. (2020). Theorizing the Triple Helix model: Past, present, and future. <i>Triple Helix Journal</i> . 6(1), pp. 1-38 Available at: https://brill.com/view/journals/thj/aop/article-10.1163-21971927-bja10003/article-10.1163-21971927-bja10003.xml.	Journal Article
De Guzman, M.J. (2020). Academe-Industry Partnership: Basis for Enhanced Learning of BSBA Students in One State University. <i>Universal Journal of Educational Research</i> , 8(12), 6574-6584. DOI: 10.13189/ujer.2020.081222.	Journal Article

53	International Journal of Disaster Resilience in the Built Environment	
` /		
	Doner, R., Intarakumnerd, P., and Ritchie, B.K. (2013). University–Industry Linkages in Thailand: Sources of Weakness in Economic Upgrading. Science Technology & Society. 18(2), pp.213-229.	Jou
		Art
	Dzisah, J. and Etzkowitz, H. (2008). Triple Helix Circulation: The Heart of Innovation and Development. International Journal of Technology Management and Sustainable Development. 7(2), pp.101-115.	Jou Arti
	Etzkowitz, H. (2008). Innovation in Innovation: The Triple Helix of University-Industry-Government Relations. <i>Social Science Information</i> . 42(3).	Jou
	Elzkowitz, 11. (2006). Innovation: The Triple Helix of Oniversity industry Government Relations. Social Science Information. 42(5).	Arti
	Gotangco, C. K., Jardeleza, J. M., Lopez, C., Labaria, E. C., Wickert, J., & Shadiya, F. (2020). Factors influencing disaster risk and resilience education in Asian HEIs. <i>International Journal of</i>	Jou
	Disaster Resilience in the Built Environment.	Art
	Guan, J. and Zhao, Q. (2013). The Impact of University-Industry Collaboration Networks on Innovation in Nanobiopharmaceuticals. Technological Forecasting and Social Change. 80(7), 1271-	Jou
	1286.	Art
	Hall, K. L., Vogel, A. L., Huang, G. C., Serrano, K. J., Rice, E. L., Tsakraklides, S. P., and Fiore, S. M. (2018). The science of team science: A review of the empirical evidence and research gaps on	
	collaboration in science. <i>American Psychologist</i> , 73(4), pp. 532–548. Hall, Z.W. and Scott, C. (2001). University-Industry Partnership. <i>Science</i> . Vol.291, No.5504, pp.553.	Art
	Han, Z. w. and Scott, C. (2001). Onlyeisity-industry Partnership. Science. Vol.251, No.3304, pp.333.	Jou Art
	Intarakumnerd, P. and Schiller, D. (2009). University-Industry Linkages in Thailand: Successes, Failures, and Lessons Learned for Other Developing Countries. Seoul Journal of Economics. 22(4),	Jou
	pp.551-589.	Art
	Intarakumnerd, P., Chairatana, P., and Chaiyanajit, P. (2016). Global Production Networks and Host-site Industrial Upgrading: The Case of the Semiconductor Industry in Thailand. Asia Pacific	Jou
	Business Review. 22(2), pp.289-306.	Art
	Jonbekova, D., Sparks, J., Hartley, M., Kuchumova, G. (2020). Development of university-industry partnerships in Kazakhstan: innovation under constraint. <i>International Journal of Educational</i>	Jou
	Development, Vol.79.	Art
	Karlsson, J., Booth, S., Odenrick, P. (2007). Academics' strategies and obstacles in achieving collaboration between universities and SMEs. <i>Tertiary Education Management</i> . 13 (3), pp.187–201.	Jou Art
	Kong, E. (2013). Strategic Trisector Collaboration in Disaster Response. World Review of Business Research. 3(2). March 2013 Issue. pp. 127 – 140.	Jou
	Rong, E. (2013). Stategic Trisector Contabilition in Distance Response. World Review of Business Research. 5(2). Hatch 2013 issue. pp. 127 170.	Art
	Liew, M.S., Shahdan, T.N.T. and Lim, E.S. (2013). Enablers in Enhancing the Relevancy of University-Industry Collaboration. <i>Procedia – Social and Behavioral Sciences</i> . 93.	Jou
		Art
	Llenares I.I., and Deocaris C.C (2018). Measuring the impact of a community extension program in the Philippines. Malaysian Journal of Learning and Instruction. 15(1), pp.35-55.	Jou
		Art
	Lorenzana E.A. & Sario A.A. (2016). Framework of collaboration of Disaster Risk Reduction Stakeholders towards Resilient Communities. Available at: http://www.cdrc-phil.com/wp-	Jou
	content/uploads/2016/04/A-PAD-Phils-Paper-Albay-Office.pdf Makin, T. (2003). The changing public-private infrastructure mix: Economy-wide implications. <i>Australian Journal of Public Administration</i> . 62(3): 32-39.	Art Jou
	istakin, 1. (2003). The changing public-private infrastructure finx. Economy-wide implications. Australian Journal of Lucite Auministration, 02(3), 32-39.	Art
	Mirc, N., Rouzies, A., and Teerikangas, S. (2017). Do Academics Actually Collaborate in the Study of Interdisciplinary Phenomena? A Look at Half a Century of Research on Mergers and	Jou
	Acquisitions. European Management Review. Vol. 14, pp.333–357.	Art
	Medina, B.O. (2019). Community Engagement of State Universities and Colleges in The Philippines: Towards Socially and Culturally Responsible Research and Extension Initiatives. International	Jou
	Journal of Advanced Research and Publications.	Art
	Nakagawa, K., Megumi, T., Kosuke, K., Matsuyuki, T., and Matsuhashi, T. (2017). A University – Industry Collaborative Entrepreneurship Education Program as a Trading Zone: The Case of	Jou
	Osaka University. Technology Innovation Management Review. Vol.7, Issue.6, pp.38-49.	Arti
	Niljang, P. and Distanont, A. (2019). Collaboration Patterns in Research Commercialization: A Case Study of Thammasat University. <i>Journal of Graduate School SDU</i> . 15(2), pp.51-68.	Jou Art
	Nylander, J.W. Ola, I. & Larsson, A. (2014) Bridging the gap between university and industry: Three mechanisms for innovation efficiency. <i>International Journal of Innovation and Technology</i>	Jou
	Management. 11(01)	Arti
	Panarina, E. (2015). University-industry Partnership as a Key Strategy for Innovative Sustainable Economic Growth. <i>Journal of International Business Research and Marketing</i> . Vol.1, Issue.1.	Jou
		Arti

Perkmann, M., Tartari, V., McKelvey, M., Autio, E., Brostorm, A., Fini, R., Geuna, A., Grimadi, R., Hughes, A., Krabel, S., Kitson, M., Llerena, P., Lissoni, F., Salter, A., and Sobrero, M. (2013).	Journal
Academic engagement and commercialisation: A review of the literature on university–industry relations. Research Policy. Vol.42, Issue.2, pp.423-442.	Article
Pittayasophon, S. and Intarakumnerd, P. (2017). University and industry collaboration in Japan and Thailand: influence of university type. <i>Asian Journal of Technology Innovation</i> . Vol.25, Issue.1, pp.23-40.	Journal Article
Prigge, G.W. and Torraco, R.J. (2006). University-Industry Partnerships: A Study of How Top American Research Universities Establish and Maintain Successful Partnerships. <i>Journal of Higher Education Outreach and Engagement</i> . Vol.11, No.2, pp.89-100.	Journal Article
Orale, R. L. (2013). Redirecting Academe-Industry Partnership for Countryside Development. Countryside Development Research Journal. 1(01), pp.9-20.	Journal
Debanton I Fermine C and Date F (2000) The influence of analysis in analysis in analysis analysis at this top of view laws as 20(2) as 450 470.	Article
Robertson, J., Ferreira, C., and Botha, E. (2019). The influence of product knowledge on the relative importance of extrinsic product attributes of wine. Journal of wine research. 29(3), pp.159-176.	Journal Article
Rodriguez, S. M. (2019). What Drives the Formation of "Valuable" Academe-Industry Partnership: The Case of HEIs and Companies in the CALABARZON. <i>International Journal of Education</i> . 4(30), 154-167.	Journal Article
Roshani, M. Lehoux, N. and Frayret, J. (2015). University-Industry Collaborations and Open Innovations: An Integrated Methodology for Mutual Beneficial Relationships. Canada: CIRRELT. 33 pages.	Journal Article
Rungfamai, K. (2018). Governance of National Research University in South East Asia: The Case of Chiang Mai University in Thailand. Studies in Higher Education. 43(7), pp. 1268-1278.	Journal Article
Rybnicek, R., & Königsgruber, R. (2018). What makes industry–university collaboration succeed? A systematic review of the literature. Journal of Business Economics. 89(2), 221–250. Available at: https://doi.org/10.1007/s11573-018-0916-6.	Journal Article
Salazar, T.B. (2020). An Impact Study of the Community Extension Programs in a State College in the Philippines. <i>International Journal of Education Science</i> . 29(1-3), 16-23.	Journal Article
Scandura, A. (2016). University-industry collaboration and firms' R&D effort. Research Policy. Vol.45, Issue.9, pp.1907-1922.	Journal Article
Schiller, D., and Diez, J. (2007). University-industry linkages. Potential and realization in developing countries: Thai experiences. <i>Tech Monitor</i> . Jan-Feb, 2007, pp.38-44.	Journal Article
Sharma, G.R. and Batala, L.K. (2016). Higher Education Institute R&D Policy in Nepali Context. <i>International Journal of Education and Research</i> . Vol.4, No.11, pp.139-150.	Journal Article
Singh, A. and Prakash, G. (2010). Public-private partnerships in health service delivery: A network organizations perspective. Public Management Review. 12(6): 829-856.	Journal Article
Strand, K., Marullo, S., Cutforth, N.J., Stoecker, R., and Donohue, P. (2003). Community-Based Research and Higher Education: Principles and Practices. Community-based research and higher education: principles and practices. San Francisco, CA: Jossey-Bass.	Journal Article
Sylva, K. K. (2019). Public-Private-Partnerships in Disaster Risk Management. 10.	Journal Article
Tantanee, S. Buranajarukorn, P. and Apichayakul, P. (2018). University-Industry Linkages in the Disaster Resilience Sector: A Case Study of Thailand. <i>Procedia Engineering</i> . Vol.212, pp.519-526.	Journal Article
Tantanee, S. Apichayakul, P. Buranajarukorn, P., Pardthaisong, L., Suwanprasit, C., Charoenpanyanet, A. and Sin-Ampol, P. (2019). Policies to promote research and innovation in developing countries' universities: The case of Thailand. <i>Indian Journal of Public Administration</i> . Available at: https://journals.sagepub.com/doi/abs/10.1177/0019556119840956.	Journal Article
Tecson-Mendoza, E.M. (2014). Academe-Industry Collaboration. ResearchGate.	Journal Article
Thayaparan, M., Malalgoda, C., Keraminiyage, K., & Amaratunga, D. (2014). Disaster Management Education through Higher Education – Industry Collaboration in the Built Environment. Procedia Economics and Finance, 18, pp.651–658. Available at: https://doi.org/10.1016/s2212-5671(14)00987-3, accessed on 30/04/2021	Journal Article
Toledo, R. J.T., Tantoy, O.A., & Paraiso, (2020) R.M. Development of disaster risk management and mitigation extension program for school-aged children in the province of Bukidnon. <i>Asia Pacific Journal of Social and Behavioral Sciences</i> , 18, 61-75	Journal Article
Trivedi, R. (2016). Does university play a significant role in shaping entrepreneurial intention? A Cross-country Comparative analysis. <i>Journal of Small Business and Enterprise Development</i> . 23(3), pp.790-811.	Journal Article

innovation-disaster-risk-management-asia. Document Paper I. Available at: https://www.britshcouncil.ph/programmes/education/reports-and-publications/opportunities-models-approaches. CHED Memorandum Order No. 104 (2017). Revised Guidelines for Student Internship Program in the Philippines (SIPP) for All Programs. Available at: https://ched.gov.ph/cmo-104-s-2017-2/ Government Document CHED Memorandum Order No. 52 (2016). Pathways to equity, relevance, and advancement in research, innovation, and extension in Philippine Higher Education. Available at: https://ched.gov.ph/cmo-104-s-2017-2/ Government Document Commission on Higher Education. (2016). 2016 CHED Memorandum Orders. Republic of Philippines. Available at: https://ched.gov.ph/2016-ched-memorandum-orders/. Government Document Department of Disaster Prevention and Mitigation (2016). Department of Disaster Prevention and Mitigation, Ministry of Interior. 90 pages. Department of Plassare Prevention and Department of Plassare Prevention and Mitigation, 2016). Department of Plassare Prevention and Mitigation, Ministry of Interior. 90 pages. Department of Pducation. DOST (2017). Collaborative Research Management and Educational Quality Assurance. (2016). Blueprint: THAILAND 4.0, Bangkok: Department of Research Management and Educational Quality Assurance. Ministry of Education. DOST (2017). Collaborative Research and Development to Leverage Philippine Economy (CRADLE). Available at: https://www.dost.gov.ph/phocadownload/Downloads/Resources/Call_ Government DOST (2017). Statement of the Relationship Report 2015: Collaboration Between Universities and Business in the UK. UK: National Centre for Universities and Business. 100 pages. Government Document Fernandez, R. (2015). Statement of the Relationship Report 2015: Collaboration Between Universities and Business in the UK. UK: National Centre for Universities and Business. 100 pages. Government Document Fernandez, R. (2015). Research, Development, and Innovation in Asia Pacific Higher Education. Ne		
Villani, E., Rasmussen, E., and Grimaldi, R. (2017). How intermediary organizations facilitate university-industry technology transfer: A proximity approach. <i>Technological forecasting and social</i> Article Walvyn, D. and Closte, J. (2016). Universities are becoming major players in the national system of innovation. <i>South African Journal of Neurosci.</i> 12, No.718, pp. 1-8. Wickermansinghe, V., & Malik, K. (2018). Universities are becoming major players in the national system of innovation. <i>South African Journal of Innovation and Technology Management</i> , 15(4). Article Wordsincha, L., Ribiere, V. and Article Wordsincha, L., Ribiere, V. and Article Wordsincha, L., Ribiere, V. and Article Asian Preparedness Partnership. (2021). <i>Landscape analysis report on innovation and Policy</i> , 5(2), pp. 116-128. Asian Preparedness Partnership. (2021). <i>Landscape analysis report on innovation for disaster risk management in Asia</i> . Available at: https://www.basia.university-industry inflange in Thailand: Concepts and issues. <i>IVNE</i> , 38(4), pp. 507-524. Journal Article Asian Preparedness Partnership. (2021). <i>Landscape analysis report on innovation for disaster risk management in Asia</i> . Available at: https://www.basia.university.com/aborations/landscape-analysis-report-locument innovation-disaster-risk-management-asia. British Couriel (2019). Opportunities. Models and Approaches for UKE-ast Asia Higher Education Partnerships to Deepen University. Collaboration William Miliam M	Vick, T.E. and Robertson, M. (2018). A systematic literature review of UK university-industry collaboration for knowledge transfer: A future research agenda. Science and Public Policy. Vol. 45,	Journal
Article Waleyn, D. and Celes, L. (2016). Universities are becoming major players in the national system of innovation. South African Journal of Science. Vol. 112, No. 7/8, pp. 1-8. Waleyn, D. and Celes, L. (2016). Universities are becoming major players in the national system of innovation. South African Journal of Innovation and Technology Management, 15(4). Article Available at: https://doi.org/10.1142/80219877018500323 Worasinchai, L. Ribiere, V. and Armizen, A.A. (2008). Working knowledge, the university-industry linkage in Thailand: Concepts and issues. ITNE. 38(4), pp. 507-524. Asian Preparedness Patnership, 1021). Landscape analysis report on innovation and Policy. 5(2), pp. 116-128. Asian Preparedness Patnership, 1021). Landscape analysis report on innovation for disaster risk management asia. British Council (2019). Opportunities. Models and Agroraches for U.E. East Asia Higher Education Partnerships to Deepen University Collaboration with Industry and Business Enterprise IWhite Document Occument University of International Occument occument occument occument in the Philippine All Programs. Available at: https://ched.gov.phi/cmo-104-s-2017-2/2 Occument Occument Occument Occument Occument Occument Occument Occument occurrency of philippine Acquainty of Internation of International Occument Occument Occument Occument Occument occurrency of International Occurrency occur		Article
Walwyn, D. and Cloete, J. (2016). Universities are becoming major players in the national system of innovation. South African Journal of Science. Vol. 112, No.718, pp. 1-8. Article Wicksransinghe, V., & Malis, K. (2018). University industry Collaboration in Sri Lanks A Developing Country Perspective. International Journal of Innovation and Technology Management, 15(4). Article Worksinchia, L. Ribiere, V. and Articles, A. (2008). Working knowledge, the university-industry linkage in Thailand: Concepts and issues. VINE. 38(4), pp. 507-524. Journal Article Article Journal Article Journal Article Journal Article Article Journal Journal Journal of Innovation and Technology Management, 15(4). Article Journal Journal Journal Journal Journal Journal of Innovation and Technology Management, 15(4). Article Journal J	Villani, E., Rasmussen, E., and Grimaldi, R. (2017). How intermediary organizations facilitate university-industry technology transfer: A proximity approach. Technological forecasting and social	Journal
Mrtickamasinghe, V., & Malik, K. (2018). University-industry Collaboration in Sri Lanka A Developing Country Perspective, International Journal of Innovation and Technology Management, 15(4). Available at: https://doi.org/10.1147/50219877018500323 Worasinchai, I., Ribiere, V. and Amtzen, AA. (2008). Working knowledge, the university-industry linkage in Thailand: Concepts and issues. WNE. 38(4), pp.507-524. Journal Article Zamora, F. (2016). Value Chain Analysis: A Brief Review. Asian Journal of Innovation and Policy, 5(2), pp.116-128. Asian Preparedness Partnership. (2021). Landscape analysis: report on unrovation for disaster risk management in Asia. Available at: https://sapp.adpc.net/publications/landscape-analysis-report British Council (2019). Opportunities, Models and Approaches for UK-East Asia Higher Education Partnerships to Deepen University Collaboration with Industry and Business Internrise (White Paper). Available at: https://www.britsh.council.ph/Grogrammes/education/reports-and-publications/opportunities-model-approaches. CIEED Memorandum Order No. 104 (2017). Revised Guidelines for Student Internship Program in the Philippines (SIPP) for All Programs. Available at: https://ched.gov.ph/coll-ched-memorandum-orders/. Decument Commission on Higher Education. (2016). Pathways to equity, relevance, and advancement in research, innovation, and extension in Philippine Higher Education. Available at: https://ched.gov.ph/2016-ched-memorandum-orders/. Decument Department of The Sizest Prevention and Mitigation. (2016). Pathways to equity. relevance, and advancement in research, innovation, and extension in Philippine Higher Education. Available at: https://ched.gov.ph/2016-ched-memorandum-orders/. Decument Department of Tesser Prevention and Mitigation. (2016). Education. Department of Tesser Prevention and Mitigation. (2016). Papartment of Education. Department of Tesser Prevention and Mitigation. (2016). Department of Education. Decument of Education. Decument of Education. Decument of E	change. Vol.114, pp.86-102.	Article
Worksanishe at: https://doi.org/10.114/25013987.104/s0125013987.134503323 Worasinchai, I., Ribiere, V. and Arntzen, A.A. (2008). Working knowledge, the university-industry linkage in Thailand: Concepts and issues. VINE. 38(4), pp.507-524. Article Zamora, F. (2016). Value Chain Analysis: A Brief Review, Asian Journal of Innovation and Policy. 5(2), pp.116-128. Asian Preparedness Partnership. (2021). Landscape analysis report on innovation for disaster risk management in Asia. Available at: https://app.adpc.net/publications/landscape-analysis-report— Document British Council (2019). Goportunities, Models and Approaches for UK-East Asia Higher Education Partnerships to Deepen University Collaboration with Industry and Business Enterprise [White Document Paperl. Available at: https://www.british.council.pl/programmes/education/reports and-publications/opportunities-models-approaches-british-document program in the Philippines (SIPP) for All Programs. Available at: https://ched.gov.ph/cmo-104-s-2017-2/ CHED Memorandum Order No. 52 (2016). Palmways to equity. relevance, and advancement in research, innovation, and extension in Philippine [Higher Education. Available at: https://ched.gov.ph/cmo-104-s-2017-2/ Covernment of Commission on Higher Education Act of 2013, Available at: https://ched.gov.ph/cmo-104-s-2017-2/ Covernment of Department of Disaster Prevention and Mitigation (2016). Department of Insaster Prevention and Mitigation (2016). Department o	Walwyn, D. and Cloete, L. (2016). Universities are becoming major players in the national system of innovation. South African Journal of Science. Vol.112, No.7/8, pp.1-8.	Journal
Available at: https://doi.org/10.1142/S0213877018500323 Worasinchai, L. Ribiere, V. and Amtzen, A.A. (2008). Working knowledge, the university-industry linkage in Thailand: Concepts and issues. VINE. 38(4), pp. 507-524. Journal Article Zamora, E. (2016). Value Chain Analysis: A Brief Review. Astan Journal of Innovation and Policy. 5(2), pp. 116-128. Article Asian Preparedness Partnership. (2021). Londscape analysis report on innovation for disaster risk management in Asia. Available at: https://wpp.adpc.net/publications/landscape-analysis-report-Document in Asia. Ovailable at: https://www.britshcouncil.ph/programmse/education freports-and-publications/copportunities-models-approaches. Document Document in Asia. Available at: https://www.britshcouncil.ph/programmse/education/ reports-and-publications/copportunities-models-approaches. Document Document on CHED Memorandum Order No. 104 (2017). Revised Guidelines for Student Internship Program in the Philippines (SIPP) for All Programs. Available at: https://ched.gov.ph/scmc-104-s-2017-2/2 Document-Uploads/2017/03/DOCH-5-25-2016 pdf Commission on Higher Education. 2016. 2016 CHED Memorandum Order No. 52 (2016). Pathways to equity, relevance, and advancement in research, innovation, and extension in Philippine Higher Education. Available at: https://ched.gov.ph/2016-ched-memorandum-orders/. Depted, DOLE, TESDA, CHED (2014). Joint guidelines on the implementation of labor and management component of Republic Act 10533 (Enhanced Basic Education Act of 2013). Available at: https://www.pacu.org.ab/horror/pass/s/orto-onien/Uploads/2017/03/DOLE-5-PEPD-TESDA-CHED-Joint-Guidelines-s-ht-Act-2.2 adf Department of Disaster Prevention and Miligation. (1016). Department of 10016). Department of 10016). Department of 10016 (1016). Department of 10016 (1016). Department of 10016). Department of 10016 (1016). Department of 1001		Article
Wortsinchai, L. Ribiere, V. and Amtzen, A.A. (2008). Working knowledge, the university-industry linkage in Thailand: Concepts and issues. VINE. 38(4), pp.507-524. Journal Article Zamora, E. (2016). Value Chain Analysis: A Brief Review. Asian Journal of Innovation and Policy. 5(2), pp.116-128. Asian Preparedness Partnership (2021). Londscape analysis report on innovation for disaster risk management in Asia. Available at: https://app.adpc.net/publications/landscape-analysis-report-loncounts-disaster-risk-management-asia. British Council (2019). Opportunities. Models and Approaches for UK-East Asia Higher Education Partnerships to Deepen University Collaboration with Industry and Business Enterprise [White Paper]. Available at: https://www.britishcouncil.ph/programmes/education/reports-and-publications/poportunities-models-approaches. CHED Memorandum Order No. 104 (2017). Revised Guidelines for Student Internship Program in the Philippines (SIPP) for All Programs. Available at: https://ched.gov.ph/cmo-104s-2017-202. COmmission on higher Education. Q2016). Pathways to equity, relevance, and advancement in research, innovation, and extension in Philippine Higher Education. Available at: https://ched.gov.ph/2016-ched-memorandum-orders/. Commission on higher Education. [2016]. 2016 CHED Memorandum Orders. Republic of Philippines. Available at: https://ched.gov.ph/2016-ched-memorandum-orders/. Department of Disaster Prevention and Mitigation with Industry of Indicine of Department of Disaster Prevention and Mitigation (Individence on Keto-12 pdf Department of Disaster Prevention and Mitigation. (2016). Department of Disaster Prevention and Mitigation (Individence on Keto-12 pdf Department of Research Management and Educational Quality Assurance. Department of Research Management and Educational Quality Assurance. Department of Proposals 2017/Call@20fe%20fe%20Proposal CRADLE. pdated.pdf Executive Order. (2012). Executive Order No. 38. Institutionalization of the Philippine Qualifications Framework. Availabl	Wickramasinghe, V., & Malik, K. (2018). University-Industry Collaboration in Sri Lanka-A Developing Country Perspective. International Journal of Innovation and Technology Management, 15(4).	Journal
Article Aziano Frey (2016). Value Chain Analysis: A Brief Review, Asian Journal of Innovation and Policy. 5(2), pp.116-128. Asian Preparedness Patnership. (2021). Landscape analysis: report on imnovation for disaster risk management in Asia. Available at: https://app.adpc.net/publications/landscape-analysis-report Document Innovation-disaster-risk-management-asia. Asian Preparedness Patnership. (2021). Landscape analysis: report on imnovation for disaster risk management in Asia. Available at: https://www.britshcouncil.pl/programmes/education/reports-and-publications/opportunities-models-approaches. CHED Memorandum Order No. 104 (2017). Revised Guidelines for Student Internship Program in the Philippines (SIPP) for All Programs. Available at: https://who.britshcouncil.pl/programs-education/reports-and-publications/opportunities-models-approaches. CHED Memorandum Order No. 104 (2017). Revised Guidelines for Student Internship Program in the Philippines (SIPP) for All Programs. Available at: https://ched.gov.ph/cmo-104-s-2017-2/2 CHED Memorandum Order No. 20 (2016). Pathways to equity, relevance, and advancement in research, innovation, and extension in Philippine Higher Education. Available at: https://ched.gov.ph/2016-ched-memorandum-orders/. Commission on Higher Education. (2016). 2016 CHED Memorandum Orders. Republic of Philippines. Available at: https://ched.gov.ph/2016-ched-memorandum-orders/. Depts. DOILE. TESDA, CHED (2014). Joint guidelines on the implementation of labor and management component of Republic Act 10533 (Enhanced Basic Education Act of 2013). Available at: http://www.nacu.org.ph/wordpress/ww-content/uploads/2017/03/DOILE-0FED-TESDA CHED-Joint-Guidelines-on-Kto-12.pdf Department of Disaster Prevention and Mitigation. (2016). Department of Mitigation, Ministry of Interior. 90 pages. DOILD TOINT (2017). Collaborative Research Management and Educational Quality Assurance. (2016). Blueprint: THAILAND 4.0, Bangkok. Department of Research Management and Educational Quality Assurance. (201	Available at: https://doi.org/10.1142/S0219877018500323	Article
Zamora, E. (2016). Value Chain Analysis: A Brief Review, Asian Journal of Innovation and Policy. 5(2), pp.116-128. Asian Preparedness Partnership. (2021). Landscape analysis report on innovation for disaster risk management in Asia. Available at: https://app.adpc.net/publications/landscape-analysis-report-bocument British Council (2019). Opportunities, Models and Approaches for UK-East Asia Higher Education Partnerships to Deepen University Collaboration with Industry and Business Enterprise IVMhite Paperl. Available at: https://www.britishcouncil.ph/programmes/education/reports-and-publications/opportunities-models-approaches. CHEID Memorandum Order No. 52 (2016). Pathways to equity, relevance, and advancement in research, innovation, and extension in Philippine Higher Education. Available at: https://ched.gov.ph/cmo-104-s-2017-2/ Government pocument CHEID Memorandum Order No. 52 (2016). Pathways to equity, relevance, and advancement in research, innovation, and extension in Philippine Higher Education. Available at: https://ched. gov.ph/wp-content/uploads/2017/10/CMO-52-s-2016.pdf Commission on Higher Education. [2016]. 2016 CHED Memorandum Orders. Republic of Philippines. Available at: https://ched.gov.ph/2016-ched-memorandum-orders/. Deptito Department of Plassater Prevention and Mitigation on the Interport of Republic Act 1053.1 (Enhanced Basic Education Act of 2013). Available at: http://www.dost.gov.ph/pocadownloads/Resources/Call_ Department of Research Management and Educational Quality Assurance, Department of Plassater Prevention and Mitigation, Ministry of Interior, 90 pages. Department of Research Management and Educational Quality Assurance, 2016). Blueprint: THAILAND 4.0., Bangkok: Department of Research Management and Educational Quality Assurance, 2016 (2017). Collaborative Research Management and Educational Quality Assurance, 2016 (2017). Collaborative Research and Development, Leavage Philippine Economy (CRADLE). Available at: https://www.dost.gov.ph/pbocadownload/Downloads/Resources/Call	Worasinchai, L. Ribiere, V. and Arntzen, A.A. (2008). Working knowledge, the university-industry linkage in Thailand: Concepts and issues. VINE. 38(4), pp.507-524.	Journal
Article Asian Preparedness Partnership. (2021). Landscape analysis report on innovation for disaster risk management in Asia. Available at: https://app.adpc.net/publications/landscape-analysis-report-pocument British Council (2019). Opportunities, Models and Approaches for UK-East Asia Higher Education Partnerships to Deepen University Collaboration with Industry and Business Enterprise [White Paper]. Available at: https://www.british.council.ph/programmes/education/reports-and-publications/opportunities-models-approaches. CHED Memorandum Order No. 104 (2017). Revised Guidelines for Student Internship Program in the Philippines (SIPP) for All Programs. Available at: https://ched.gov.ph/cmo-104-s-2017-2/2 Covernment CHED Memorandum Order No. 52 (2016). Pathways to equity, relevance, and advancement in research, innovation, and extension in Philippine Higher Education. Available at: https://ched.gov.ph/2016-ched-memorandum-orders/. Commission on Higher Education. (2016). 2016 CHED Memorandum Orders. Republic of Philippines. Available at: https://ched.gov.ph/2016-ched-memorandum-orders/. Department of Disaster Prevention and Mitigation. (2016). Bilieprim: THAILAND 4.0, Bangkok: Department of Disaster Prevention and Mitigation. (2017). Collaborative Research Management and Educational Quality Assurance. DOST (2017). Collaborative Research and Development to Leverage Philippine Economy (CRADLE). Available at: https://www.dost.gov.ph/phocadownload/Downloads/Resources/Call_ DOCUment DOST (2017). Collaborative Research and Development to Leverage Philippine Economy (CRADLE). Available at: https://www.dost.gov.ph/phocadownload/Downloads/Resources/Call_ DOCUment DOST (2017). Collaborative Research and Development to Leverage Philippine Economy (CRADLE). Available at: https://www.dost.gov.ph/phocadownload/Downloads/Resources/Call_ Document DOST (Article
Asian Preparedness Partnership, (2021). Landscape analysis report on innovation for disaster risk management in Asia. Available at: https://app.adpc.net/publications/landscape-analysis-report-innovation-disaster-risk-management-saia. British Council (2019). Opportunities. Models and Approaches for UK-East Asia Higher Education Partnerships to Deepen University Collaboration with Industry and Business Enterprise [White Paper]. Available at: https://www.britishcouncil.ph/programmes/education/reports-and-publications/opportunities-models-approaches. CHED Memorandum Order No. 104 (2017). Revised Guidelines for Student Internship Program in the Philippines (SIPP) for All Programs. Available at: https://ched.gov.ph/cmo-104-s-2017-2/2 Document Occument of Philippines (SIPP) for All Programs. Available at: https://ched.gov.ph/cmo-104-s-2017-2/2 Document Occument of Philippines (SIPP) for All Programs. Available at: https://ched.gov.ph/2016-ched-memorandum-orders/. Commission on Higher Education. Available at: https://ched.gov.ph/2016-ched-memorandum-orders/. Deptd. DOIE, TESDA, CHED (2014). Joint guidelines on the implementation of labor and management component of Republic Act 10533 (Enhanced Basic Education Act of 2013). Available at: https://www.pacu.org.ph/wordpress/wp-content/uploads/2017/03/DOIE-DEPDE-TESDA-CHED-Joint-Guidelines-on-k-to-12.adf Department of Disaster Prevention and Mitigation. (2016). Department of Disaster Prevention and Mitigation (2016). Department of Research Management and Educational Quality Assurance, Ministry of Education. DOST (2017). Callaborative Research and Development to Leverage Philippine Economy (CRADLE). Available at: https://www.dost.gov.ph/phocadownload/Downloads/Resources/Call_Document Freecutive Order. 2012). Executive Order No. 83. Institutionalization of the Philippine Qualifications Framework. Available at: https://www.officialgazette.gov.ph/2012/10/01/executive-order-no-Document Freeduce Order (2012). Executive Order No. 83. Institutionalization of the Philippin	Zamora, E. (2016). Value Chain Analysis: A Brief Review. Asian Journal of Innovation and Policy. 5(2), pp.116-128.	Journal
innovation-disaster-risk-management-asia. Document Paper, Available at https://www.britishcouncil.ph/programmes/education/reports-and-publications/opportunities-models-approaches. CHED Memorandum Order No. 104 (2017). Revised Guidelines for Student Internship Program in the Philippines (SIPP) for All Programs. Available at: https://ched.gov.ph/emo-104-s-2017-2/ Government CHED Memorandum Order No. 52 (2016). Pathways to equity, relevance, and advancement in research, innovation, and extension in Philippine Higher Education. Available at: https://ched.gov.ph/pro-104-s-2017-2/ Government Commission on Higher Education. (2016). 2016 CHED Memorandum Orders. Republic of Philippines. Available at: https://ched.gov.ph/2016-ched-memorandum-orders/. Government Depted, DOLE, TESDA, CHED (2014). Joint guidelines on the implementation of labor and management component of Republic Act 10533 (Enhanced Basic Education Act of 2013). Available at: https://www.pacu.org.ph/wordpress/wp-content/uploads/2017/03/DOLE-DEPED-TESDA CHED Joint Guidelines on Eto 12, gdf Department of Disaster Prevention and Mitigation, (2016). Department Disaster Prevention and Mitigation, Ministry of Interior. 90 pages. Department of Research Management and Educational Quality Assurance. (2016). Blueprint: THAILAND 4.0, Bangkok: Department of Research Management and Educational Quality Assurance. (2016). Blueprint: THAILAND 4.0, Bangkok: Department of Research Management and Educational Quality Assurance. (2016). Blueprint: THAILAND 4.0, Bangkok: Department of Research Management and Educational Quality Assurance. (2016). Blueprint: THAILAND 4.0, Bangkok: Department of Proposals/2017/Call%2019/Call%		Article
British Council (2019). Opportunities, Models and Approaches for UK-East Asia Higher Education Partnerships to Deepen University Collaboration with Industry and Business Enterprise [White Paper]. Available at: https://www.britshcouncil.ph/programmes/education/ reports-and-publications/opportunities-models-approaches (SIPP) for All Programs. Available at: https://ched.gov.ph/cmo-104-s-2017-2/ Government Document CHED Memorandum Order No. 52 (2016). Pathways to equity, relevance, and advancement in research, innovation, and extension in Philippine Higher Education. Available at: https://ched. gov.ph/wp-content/uploads/2017/10/CMO-52-s-2016.pdf Government pocument on Higher Education. [2016]. 2016 CHED Memorandum Orders. Republic of Philippines. Available at: https://ched.gov.ph/2016-ched-memorandum-orders/. Government Document Paperd, DOLE, TESDA, CHED (2014). Joint guidelines on the implementation of labor and management component of Republic Act 1054 pdf Document of Disaster Prevention and Mitigation. (2016). Department of Disaster Prevention and Mitigation. (2016). Department of Disaster Prevention and Mitigation. (2016). Department of Disaster Prevention and Mitigation. Ministry of Interior. 90 pages. Document of Research Management and Educational Quality Assurance, (2016). Blueprint: THAILAND 4.0., Bangkok: Department of Research Management and Educational Quality Assurance, (2016). Statement of Leverage Philippine Economy (CRADLE). Available at: https://www.dost.gov.ph/phocadownload/Downloads/Resources/Call_Government for_Proposals/2017/Call%20for%20Proposal_CRADLE_updated.pdf Government	Asian Preparedness Partnership. (2021). Landscape analysis report on innovation for disaster risk management in Asia. Available at: https://app.adpc.net/publications/landscape-analysis-report-	Government
Document OHED Memorandum Order No. 104 (2017). Revised Guidelines for Student Internship Program in the Philippines (SIPP) for All Programs. Available at: https://ched.gov.ph/cmo-104-s-2017-2/ Decument OHED Memorandum Order No. 52 (2016). Pathways to equity, relevance, and advancement in research, innovation, and extension in Philippine Higher Education. Available at: https://ched.gov.ph/cmo-104-s-2017-2/ Overment Occument	innovation-disaster-risk-management-asia.	Document
CHED Memorandum Order No. 104 (2017). Revised Guidelines for Student Internship Program in the Philippines (SIPP) for All Programs. Available at: https://ched.gov.ph/cmo-104-s-2017-2/ Government gov.ph/wp-content/uploads/2017/10/CMO-52-s-2016.pdf Commission on Higher Education. Available at: https://ched.gov.ph/2016-ched-memorandum-orders/. Commission on Higher Education. (2016). 2016 CHED Memorandum Orders. Republic of Philippines. Available at: https://ched.gov.ph/2016-ched-memorandum-orders/. DepEd. DOLE, TESDA, CHED [2014]. Joint guidelines on the implementation of labor and management component of Republic Act 10533 (Enhanced Basic Education Act of 2013). Available at: https://www.pacu.org.ph/wordpress/wp-content/uploads/2017/03/DOLE-DEPED-TESDA. CHED-Joint-Guidelines-on-K-to-12.pdf Department of Disaster Prevention and Mitigation, (2016). Department Disaster Prevention and Mitigation (DDPM) Strategy Plan 2017-2021. Bangkok: Department of Disaster Prevention and Mitigation (DDPM) Strategy Plan 2017-2021. Bangkok: Department of Disaster Prevention and Development to Leverage Philippine Economy (CRADLE). Available at: https://www.dost.gov.ph/phocadownload/Downloads/Resources/Call_DOST (2017). Collaborative Research and Development to Leverage Philippine Economy (CRADLE). Available at: https://www.officialgazette.gov.ph/2012/10/01/executive-order-no-83-s-2012/ Fernandez, R. (2015). Statement of the Relationship Report 2015: Collaboration Between Universities and Business in the UK. UK: National Centre for Universities and Business. 100 pages. Government Document Government Document Government Document Again, J. (2013). Promoting university-industry collaboration in Asia Pacific Higher Education. New York: Palgrave Macmillan. Government Document Government Document Larsen, K., Bandara, D. C., Esham, M., & Unantenne, R. (2016). Promoting University-industry Collaboration in Sri Lanka: Status, Case Studies, and Policy Options (Directions in Development). In Document The World Bank Publication. Availab	British Council (2019). Opportunities, Models and Approaches for UK-East Asia Higher Education Partnerships to Deepen University Collaboration with Industry and Business Enterprise [White	Government
Document CHED Memorandum Order No. 52 (2016). Pathways to equity, relevance, and advancement in research, innovation, and extension in Philippine Higher Education. Available at: https://ched. gov.ph/wp-content/uploads/2017/10/CMO-52-s2016.pdf Commission on Higher Education. (2016). 2016 CHED Memorandum Orders. Republic of Philippines, Available at: https://ched.gov.ph/2016-ched-memorandum-orders/. Government Document DepEd. DOLE, TESDA. CHED (2014). Joint guidelines on the implementation of labor and management component of Republic Act 10533 (Enhanced Basic Education Act of 2013). Available at: https://www.pacu.org.ph/wordpress/wp-content/uploads/2017/03/DOLE-DEPED-TESDA-CHED-Joint-Guidelines-on-R-Kto-12.pdf Department of Disaster Prevention and Mitigation. (2016). Department Disaster Prevention and Mitigation (DDPM) Strategy Plan 2017-2021. Bangkok: Department of Disaster Prevention and Mitigation, Ministry of Interior. 90 pages. Department of Research Management and Educational Quality Assurance. (2016). Blueprint: THAILAND 4.0., Bangkok: Department of Research Management and Educational Quality Assurance. Document Document Or Proposals/2017/Call/bacoffive/20Proposal_CRADLE_updated.pdf Government DOST (2017). Collaborative Research and Development to Leverage Philippine Economy (CRADLE). Available at: https://www.dost.gov.ph/phocadownloads/Resources/Call_for Proposals/2017/Call/bacoffive/20Proposal_CRADLE_updated.pdf Fernandez, R. (2015). Executive Order No. 83. Institutionalization of the Philippine Qualifications Framework. Available at https://www.officialgazette.gov.ph/2012/10/01/executive-order-no-Bas-soll/. Government Document Government Document Government Document Government Document of the Relationship Report 2015: Collaboration Between Universities and Business in the UK. UK: National Centre for Universities and Business. 100 pages. Government Document Hakins, J.N. and Mok, K.H. (2015). Research, Development, and Innovation in Asia Pacific Higher Education. New York: Palgrave Macmill	Paper]. Available at: https://www.britishcouncil.ph/programmes/education/ reports-and-publications/opportunities-models-approaches.	Document
CHED Memorandum Order No. 52 (2016). Pathways to equity, relevance, and advancement in research, innovation, and extension in Philippine Higher Education. Available at: https://ched.gov.ph/pocontent/uploads/2017/10/CMO-52-s2016.pdf Commission on Higher Education. (2016). 2016 CHED Memorandum Orders. Republic of Philippines, Available at: https://ched.gov.ph/2016-ched-memorandum-orders/. DepEd, DOLE, TESDA, CHED (2014). Joint guidelines on the implementation of labor and management component of Republic Act 10533 (Enhanced Basic Education Act of 2013). Available at: https://www.pacu.org.ph/wordpress/wp-content/uploads/2017/03/00LE-DEPED-TESDA-CHED-Joint-Guidelines-on-K-to-12.pdf Department of Disaster Prevention and Mitigation. (2016). Department Disaster Prevention and Mitigation (DDPM) Strategy Plan 2017-2021. Bangkok: Department of Disaster Prevention and Document of Research Management and Educational Quality Assurance. (2016). Blueprint: THAILAND 4.0., Bangkok: Department of Research Management and Educational Quality Assurance. (Government Ministry of Education. DOST (2017). Collaborative Research and Development to Leverage Philippine Economy (CRADLE). Available at: https://www.dost.gov.ph/phocadownload/Downloads/Resources/Call_ Document Executive Order. (2012). Executive Order. (2013). Promoting university-industry collaboration Between Universities and Business in the UK. UK: National Centre for Universities and Business. 100 pages. Government Document Guimón, J. (2013). Promoting university-industry collaboration in Asia Pacific Higher Education. New York: Palgrave Macmillan. Government Document Larsen, K., Bandara, D. C., Esham, M., & Unantenne, R. (2016). Promoting University-industry Collaboration in Sri Lanka: Status, Case Studies, and Policy Options (Directions in Development). In Document The World Bank Publication. Available at: https://d	CHED Memorandum Order No. 104 (2017). Revised Guidelines for Student Internship Program in the Philippines (SIPP) for All Programs. Available at: https://ched.gov.ph/cmo-104-s-2017-2/	Government
gov.ph/wp-content/uploads/2017/10/CMO-52-s2016.pdf Occument Commission on Higher Education. (2016). 2016 CHED Memorandum Orders. Republic of Philippines. Available at: https://ched.gov.ph/2016-ched-memorandum-orders/. Dep6d, DOLE, TESDA, CHED (2014). Joint guidelines on the implementation of labor and management component of Republic Act 10533 (Enhanced Basic Education Act of 2013). Available at: https://www.pacu.org.ph/wordpress/wp-content/uploads/2017/03/DOLE-DEPED-TESDA-CHED-Joint-Guidelines-on-K-to-12.pdf Department of Disaster Prevention and Mitigation. (2016). Department Disaster Prevention and Mitigation, Ministry of Interior. 90 pages. Department of Research Management and Educational Quality Assurance. (2016). Blueprint: THAILAND 4.0., Bangkok: Department of Research Management and Educational Quality Assurance. Document Docu		Document
Commission on Higher Education. (2016). 2016 CHED Memorandum Orders. Republic of Philippines. Available at: https://ched.gov.ph/2016-ched-memorandum-orders/. Dep6d, DOLE, TESDA, CHED (2014). Joint guidelines on the implementation of labor and management component of Republic Act 10533 (Enhanced Basic Education Act of 2013). Available at: https://www.pacu.org.ph/wordpress/wp-content/uploads/2017/03/DOLE-DEPED-TESDA-CHED-Joint-Guidelines-on-K-to-12.pdf Department of Disaster Prevention and Mitigation. (2016). Department Disaster Prevention and Mitigation (DDPM) Strategy Plan 2017-2021. Bangkok: Department of Disaster Prevention and Mitigation. Ministry of Interior. 90 pages. Department of Research Management and Educational Quality Assurance, (2016). Blueprint: THAILAND 4.0., Bangkok: Department of Research Management and Educational Quality Assurance, Ministry of Education. DOST (2017). Collaborative Research and Development to Leverage Philippine Economy (CRADLE). Available at: https://www.dost.gov.ph/phocadownload/Downloads/Resources/Call_ 50cvernment for Proposals/2017/Call%20for%20Proposal_CRADLE_updated.pdf Executive Order. (2012). Executive Order No. 83. Institutionalization of the Philippine Qualifications Framework. Available at https://www.officialgazette.gov.ph/2012/10/01/executive-order-no-33ss-2012/ Fernandez, R. (2015). Statement of the Relationship Report 2015: Collaboration Between Universities and Business in the UK. UK: National Centre for Universities and Business. 100 pages. Government Document Hakins, J.N. and Mok, K.H. (2015). Research, Development, and Innovation in Asia Pacific Higher Education. New York: Palgrave Macmillan. Government Document Larsen, K., Bandara, D. C., Esham, M., & Unantenne, R. (2016). Promoting University-Industry Collaboration in Sri Lanka: Status, Case Studies, and Policy Options (Directions in Development). In The World Bank Publication. Available at: https://doi.org/10.1596/918-1-4648-0922-4_ch.1.	CHED Memorandum Order No. 52 (2016). Pathways to equity, relevance, and advancement in research, innovation, and extension in Philippine Higher Education. Available at: https://ched.	Government
DepEd, DOLE, TESDA, CHED (2014), Joint guidelines on the implementation of labor and management component of Republic Act 10533 (Enhanced Basic Education Act of 2013). Available at: https://www.pacu.org.ph/wordpress/wp-content/uploads/2017/03/DOLE-DEPED-TESDA-CHED-Joint-Guidelines-on-K-to-12.pdf Department of Disaster Prevention and Mitigation. (2016). Department Disaster Prevention and Mitigation (DDPM) Strategy Plan 2017-2021. Bangkok: Department of Disaster Prevention and Mitigation, Ministry of Interior. 90 pages. Department of Research Management and Educational Quality Assurance, (2016). Blueprint: THAILAND 4.0., Bangkok: Department of Research Management and Educational Quality Assurance, Ministry of Education. DOST (2017). Collaborative Research and Development to Leverage Philippine Economy (CRADLE). Available at: https://www.dost.gov.ph/phocadownload/Downloads/Resources/Call_ for Proposals/2017/Call%20for%20Proposal_CRADLE_updated.pdf Securitive Order. (2012). Executive Order No. 83. Institutionalization of the Philippine Qualifications Framework. Available at https://www.officialgazette.gov.ph/2012/10/01/executive-order-no-go-cument Document Order. (2015). Statement of the Relationship Report 2015: Collaboration Between Universities and Business in the UK. UK: National Centre for Universities and Business. 100 pages. Government Document Hakins, J.N. and Mok, K.H. (2015). Research, Development, and Innovation in Asia Pacific Higher Education. New York: Palgrave Macmillan. Government Document Larsen, K., Bandara, D. C., Esham, M., & Unantenne, R. (2016). Promoting University-Industry Collaboration in Sri Lanka: Status, Case Studies, and Policy Options (Directions in Development). In Document Martin, M. (2000). Managing University-Relations: A Study of Institutional Practices from 12 Different Countries. Working document in the series: Improving the Managerial Effectiveness of Higher Education Institutions. International Institutions International Institutions International Institutions Document D	gov.ph/wp-content/uploads/2017/10/CMO-52-s2016.pdf	Document
DepEd, DOLE, TESDA, CHED (2014). Joint guidelines on the implementation of labor and management component of Republic Act 10533 (Enhanced Basic Education Act of 2013). Available at: http://www.pacu.org.ph/wordpress/wp-content/uploads/2017/03/DOLE-DEPED-TESDA-CHED-Joint-Guidelines-on-K-to-12.pdf Department of Disaster Prevention and Mitigation. (2016). Department Disaster Prevention and Mitigation (DDPM) Strategy Plan 2017-2021. Bangkok: Department of Disaster Prevention and Mitigation. Ministry of Interior. 90 pages. Department of Research Management and Educational Quality Assurance. (2016). Blueprint: THAILAND 4.0., Bangkok: Department of Research Management and Educational Quality Assurance. Ministry of Education. DOST (2017). Collaborative Research and Development to Leverage Philippine Economy (CRADLE). Available at: https://www.dost.gov.ph/phocadownload/Downloads/Resources/Call_ for Proposals/2017/Call/%20for%20Proposal_CRADLE_updated.pdf Executive Order. (2012). Executive Order No. 83. Institutionalization of the Philippine Qualifications Framework. Available at https://www.officialgazette.gov.ph/2012/10/01/ executive-order-no- 33-s-2012/ Fernandez, R. (2015). Statement of the Relationship Report 2015: Collaboration Between Universities and Business in the UK. UK: National Centre for Universities and Business. 100 pages. Government Document Hakins, J.N. and Mok, K.H. (2015). Research, Development, and Innovation in Asia Pacific Higher Education. New York: Palgrave Macmillan. Government Document Larsen, K., Bandara, D. C., Esham, M., & Unantenne, R. (2016). Promoting University-Industry Collaboration in Sri Lanka: Status, Case Studies, and Policy Options (Directions in Development). In Document Martin, M. (2000). Managing University-Paladustry Relations: A Study of Institutional Practices from 12 Different Countries. Working document in the series: Improving the Managerial Effectiveness of Higher Education Institutions. International Institute for Educational Planning/ UNESCO, Paris.	Commission on Higher Education. (2016). 2016 CHED Memorandum Orders. Republic of Philippines. Available at: https://ched.gov.ph/2016-ched-memorandum-orders/.	Government
http://www.pacu.org.ph/wordpress/wp-content/uploads/2017/03/DOLE-DEPED-TESDA-CHED-Joint-Guidelines-on-K-to-12.pdf Department of Disaster Prevention and Mitigation. (2016). Department Disaster Prevention and Mitigation, Ministry of Interior. 90 pages. Department of Research Management and Educational Quality Assurance. (2016). Blueprint: THAILAND 4.0., Bangkok: Department of Research Management and Educational Quality Assurance. (Bovernment Document DOST (2017). Collaborative Research and Development to Leverage Philippine Economy (CRADLE). Available at: https://www.dost.gov.ph/phocadownload/Downloads/Resources/Call_ Government Document Executive Order. (2012). Executive Order No. 83. Institutionalization of the Philippine Qualifications Framework. Available at https://www.officialgazette.gov.ph/2012/10/01/ executive-order-no-83-s-2012/ Fernandez, R. (2015). Statement of the Relationship Report 2015: Collaboration Between Universities and Business in the UK. UK: National Centre for Universities and Business. 100 pages. Government Guimón, J. (2013). Promoting university-industry collaboration in developing countries. World Bank, 3, 12-48. Hakins, J.N. and Mok, K.H. (2015). Research, Development, and Innovation in Asia Pacific Higher Education. New York: Palgrave Macmillan. Hakins, J.N. and Mok, K.H. (2015). Research, Development, and Innovation in Asia Pacific Higher Education. New York: Palgrave Macmillan. Government Document Larsen, K., Bandara, D. C., Esham, M., & Unantenne, R. (2016). Promoting University-Industry Collaboration in Sri Lanka: Status, Case Studies, and Policy Options (Directions in Development). In The World Bank Publication. Available at: https://doi.org/10.1596/978-1-4648-0922-4_ch1. Government Document The World Bank Publication. Available at: https://doi.org/10.1596/978-1-4648-0922-4_ch1. Government Document The World Bank Publication. Available at: https://doi.org/10.1596/978-1-4648-0922-4_ch1. Government Document The World Bank Publication. Available at: https://doi.org/10.1596/		Document
Department of Disaster Prevention and Mitigation. (2016). Department Disaster Prevention and Mitigation (DDPM) Strategy Plan 2017-2021. Bangkok: Department of Disaster Prevention and Mitigation, Ministry of Interior. 90 pages. Department of Research Management and Educational Quality Assurance. (2016). Blueprint: THAILAND 4.0., Bangkok: Department of Research Management and Educational Quality Assurance, Ministry of Education. DOST (2017). Collaborative Research and Development to Leverage Philippine Economy (CRADLE). Available at: https://www.dost.gov.ph/phocadownload/Downloads/Resources/Call_ Government of Proposals/2017/Call%20for%20Proposal_CRADLE_updated.pdf Executive Order. (2012). Executive Order No. 83. Institutionalization of the Philippine Qualifications Framework. Available at https://www.officialgazette.gov.ph/2012/10/01/executive-order-no-Bocument Fernandez, R. (2015). Statement of the Relationship Report 2015: Collaboration Between Universities and Business in the UK. UK: National Centre for Universities and Business. 100 pages. Government Document Hakins, J.N. and Mok, K.H. (2015). Research, Development, and Innovation in Asia Pacific Higher Education. New York: Palgrave Macmillan. Government Document Larsen, K., Bandara, D. C., Esham, M., & Unantenne, R. (2016). Promoting University-Industry Collaboration in Sri Lanka: Status, Case Studies, and Policy Options (Directions in Development). In Document Martin, M. (2000). Managing University-Industry Relations: A Study of Institutional Practices from 12 Different Countries. Working document in the series: Improving the Managerial Effectiveness of Higher Education Institutions. International Institute for Educational Planning/ UNESCO, Paris.	DepEd, DOLE, TESDA, CHED (2014). Joint guidelines on the implementation of labor and management component of Republic Act 10533 (Enhanced Basic Education Act of 2013). Available at:	Government
Mitigation, Ministry of Interior. 90 pages. Document Department of Research Management and Educational Quality Assurance, (2016). Blueprint: THAILAND 4.0., Bangkok: Department of Research Management and Educational Quality Assurance, Ministry of Education. DOST (2017). Collaborative Research and Development to Leverage Philippine Economy (CRADLE). Available at: https://www.dost.gov.ph/phocadownload/Downloads/Resources/Call_ for_Proposals/2017/Call%20for%20Proposal_CRADLE_updated.pdf Executive Order. (2012). Executive Order No. 83. Institutionalization of the Philippine Qualifications Framework. Available at https://www.officialgazette.gov.ph/2012/10/01/executive-order-no-B3-s-2012/ Fernandez, R. (2015). Statement of the Relationship Report 2015: Collaboration Between Universities and Business in the UK. UK: National Centre for Universities and Business. 100 pages. Government Document Hakins, J.N. and Mok, K.H. (2015). Research, Development, and Innovation in Asia Pacific Higher Education. New York: Palgrave Macmillan. Hakins, J.N. and Mok, K.H. (2015). Research, Development, and Innovation in Asia Pacific Higher Education in Sri Lanka: Status, Case Studies, and Policy Options (Directions in Development). In Document Martin, M. (2000). Managing University-Industry Relations: A Study of Institutional Practices from 12 Different Countries. Working document in the series: Improving the Managerial Effectiveness of Higher Education Institutions. International Institute for Educational Planning/ UNESCO, Paris. Document Documen	http://www.pacu.org.ph/wordpress/wp-content/uploads/2017/03/DOLE-DEPED-TESDA-CHED-Joint-Guidelines-on-K-to-12.pdf	Document
Department of Research Management and Educational Quality Assurance, (2016). Blueprint: THAILAND 4.0., Bangkok: Department of Research Management and Educational Quality Assurance, Ministry of Education. DOST (2017). Collaborative Research and Development to Leverage Philippine Economy (CRADLE). Available at: https://www.dost.gov.ph/phocadownload/Downloads/Resources/Call_ Government Document Texecutive Order. (2012). Executive Order No. 83. Institutionalization of the Philippine Qualifications Framework. Available at https://www.officialgazette.gov.ph/2012/10/01/ executive-order-no-B3-s-2012/ Fernandez, R. (2015). Statement of the Relationship Report 2015: Collaboration Between Universities and Business in the UK. UK: National Centre for Universities and Business. 100 pages. Government Document Guimón, J. (2013). Promoting university-industry collaboration in developing countries. World Bank, 3, 12-48. Government Document Hakins, J.N. and Mok, K.H. (2015). Research, Development, and Innovation in Asia Pacific Higher Education. New York: Palgrave Macmillan. Government Document Larsen, K., Bandara, D. C., Esham, M., & Unantenne, R. (2016). Promoting University-Industry Collaboration in Sri Lanka: Status, Case Studies, and Policy Options (Directions in Development). In Document Martin, M. (2000). Managing University-Industry Relations: A Study of Institutional Practices from 12 Different Countries. Working document in the series: Improving the Managerial Effectiveness of Higher Education Institutions. International Institute for Educational Planning/ UNESCO, Paris.	Department of Disaster Prevention and Mitigation. (2016). Department Disaster Prevention and Mitigation (DDPM) Strategy Plan 2017-2021. Bangkok: Department of Disaster Prevention and	Government
Ministry of Education. DOST (2017). Collaborative Research and Development to Leverage Philippine Economy (CRADLE). Available at: https://www.dost.gov.ph/phocadownload/Downloads/Resources/Call_for_Proposals/2017/Call%20for%20Proposal_CRADLE_updated.pdf Executive Order (2012). Executive Order No. 83. Institutionalization of the Philippine Qualifications Framework. Available at https://www.officialgazette.gov.ph/2012/10/01/ executive-order-no-Document Pernandez, R. (2015). Statement of the Relationship Report 2015: Collaboration Between Universities and Business in the UK. UK: National Centre for Universities and Business. 100 pages. Government Document Hakins, J.N. and Mok, K.H. (2015). Research, Development, and Innovation in Asia Pacific Higher Education. New York: Palgrave Macmillan. Government Document Larsen, K., Bandara, D. C., Esham, M., & Unantenne, R. (2016). Promoting University-Industry Collaboration in Sri Lanka: Status, Case Studies, and Policy Options (Directions in Development). In Pocument Martin, M. (2000). Managing University-Industry Relations: A Study of Institutional Practices from 12 Different Countries. Working document in the series: Improving the Managerial Effectiveness of Higher Education Institutions. International Institute for Educational Planning/ UNESCO, Paris.	Mitigation, Ministry of Interior. 90 pages.	Document
DOST (2017). Collaborative Research and Development to Leverage Philippine Economy (CRADLE). Available at: https://www.dost.gov.ph/phocadownload/Downloads/Resources/Call_for_Proposals/2017/Call%20for%20Proposal_CRADLE_updated.pdf Executive Order. (2012). Executive Order No. 83. Institutionalization of the Philippine Qualifications Framework. Available at https://www.officialgazette.gov.ph/2012/10/01/ executive-order-no-government_Document Fernandez, R. (2015). Statement of the Relationship Report 2015: Collaboration Between Universities and Business in the UK. UK: National Centre for Universities and Business. 100 pages. Government_Document Guimón, J. (2013). Promoting university-industry collaboration in developing countries. World Bank, 3, 12-48. Government_Document Hakins, J.N. and Mok, K.H. (2015). Research, Development, and Innovation in Asia Pacific Higher Education. New York: Palgrave Macmillan. Government_Document Larsen, K., Bandara, D. C., Esham, M., & Unantenne, R. (2016). Promoting University-Industry Collaboration in Sri Lanka: Status, Case Studies, and Policy Options (Directions in Development). In Document The World Bank Publication. Available at: https://doi.org/10.1596/978-1-4648-0922-4_ch1. Martin, M. (2000). Managing University-Industry Relations: A Study of Institutional Practices from 12 Different Countries. Working document in the series: Improving the Managerial Effectiveness of Higher Education Institutions. International Institute for Educational Planning/ UNESCO, Paris.	Department of Research Management and Educational Quality Assurance. (2016). Blueprint: THAILAND 4.0., Bangkok: Department of Research Management and Educational Quality Assurance,	Government
for Proposals/2017/Call%20for%20Proposal_CRADLE_updated.pdf Executive Order. (2012). Executive Order No. 83. Institutionalization of the Philippine Qualifications Framework. Available at https://www.officialgazette.gov.ph/2012/10/01/ executive-order-no-B3-s-2012/ Fernandez, R. (2015). Statement of the Relationship Report 2015: Collaboration Between Universities and Business in the UK. UK: National Centre for Universities and Business. 100 pages. Government Document Guimón, J. (2013). Promoting university-industry collaboration in developing countries. World Bank, 3, 12-48. Government Document Hakins, J.N. and Mok, K.H. (2015). Research, Development, and Innovation in Asia Pacific Higher Education. New York: Palgrave Macmillan. Government Larsen, K., Bandara, D. C., Esham, M., & Unantenne, R. (2016). Promoting University-Industry Collaboration in Sri Lanka: Status, Case Studies, and Policy Options (Directions in Development). In Document Martin, M. (2000). Managing University-Industry Relations: A Study of Institutional Practices from 12 Different Countries. Working document in the series: Improving the Managerial Effectiveness of Higher Education Institutions. International Institute for Educational Planning/ UNESCO, Paris.	Ministry of Education.	Document
Executive Order. (2012). Executive Order No. 83. Institutionalization of the Philippine Qualifications Framework. Available at https://www.officialgazette.gov.ph/2012/10/01/ executive-order-no-Document Document Larsen, K., Bandara, D. C., Esham, M., & Unantenne, R. (2016). Promoting University-Industry Collaboration in Sri Lanka: Status, Case Studies, and Policy Options (Directions in Development). In Document Doc	DOST (2017). Collaborative Research and Development to Leverage Philippine Economy (CRADLE). Available at: https://www.dost.gov.ph/phocadownload/Downloads/Resources/Call	Government
Fernandez, R. (2015). Statement of the Relationship Report 2015: Collaboration Between Universities and Business in the UK. UK: National Centre for Universities and Business. 100 pages. Guimón, J. (2013). Promoting university-industry collaboration in developing countries. World Bank, 3, 12-48. Government Document Hakins, J.N. and Mok, K.H. (2015). Research, Development, and Innovation in Asia Pacific Higher Education. New York: Palgrave Macmillan. Government Document Larsen, K., Bandara, D. C., Esham, M., & Unantenne, R. (2016). Promoting University-Industry Collaboration in Sri Lanka: Status, Case Studies, and Policy Options (Directions in Development). In Document The World Bank Publication. Available at: https://doi.org/10.1596/978-1-4648-0922-4_ch1. Martin, M. (2000). Managing University-Industry Relations: A Study of Institutional Practices from 12 Different Countries. Working document in the series: Improving the Managerial Effectiveness of Higher Education Institutions. International Institute for Educational Planning/ UNESCO, Paris.	for_Proposals/2017/Call%20for%20Proposal_CRADLE_updated.pdf	Document
Fernandez, R. (2015). Statement of the Relationship Report 2015: Collaboration Between Universities and Business in the UK. UK: National Centre for Universities and Business. 100 pages. Guimón, J. (2013). Promoting university-industry collaboration in developing countries. World Bank, 3, 12-48. Government Document Hakins, J.N. and Mok, K.H. (2015). Research, Development, and Innovation in Asia Pacific Higher Education. New York: Palgrave Macmillan. Government Document Larsen, K., Bandara, D. C., Esham, M., & Unantenne, R. (2016). Promoting University-Industry Collaboration in Sri Lanka: Status, Case Studies, and Policy Options (Directions in Development). In Document Martin, M. (2000). Managing University-Industry Relations: A Study of Institutional Practices from 12 Different Countries. Working document in the series: Improving the Managerial Effectiveness of Higher Education Institutions. International Institute for Educational Planning/ UNESCO, Paris.	Executive Order. (2012). Executive Order No. 83. Institutionalization of the Philippine Qualifications Framework. Available at https://www.officialgazette.gov.ph/2012/10/01/ executive-order-no-	Government
Guimón, J. (2013). Promoting university-industry collaboration in developing countries. World Bank, 3, 12-48. Hakins, J.N. and Mok, K.H. (2015). Research, Development, and Innovation in Asia Pacific Higher Education. New York: Palgrave Macmillan. Government Document Larsen, K., Bandara, D. C., Esham, M., & Unantenne, R. (2016). Promoting University-Industry Collaboration in Sri Lanka: Status, Case Studies, and Policy Options (Directions in Development). In The World Bank Publication. Available at: https://doi.org/10.1596/978-1-4648-0922-4_ch1. Martin, M. (2000). Managing University-Industry Relations: A Study of Institutional Practices from 12 Different Countries. Working document in the series: Improving the Managerial Effectiveness of Higher Education Institutions. International Institute for Educational Planning/ UNESCO, Paris.	83-s-2012/	Document
Guimón, J. (2013). Promoting university-industry collaboration in developing countries. World Bank, 3, 12-48. Hakins, J.N. and Mok, K.H. (2015). Research, Development, and Innovation in Asia Pacific Higher Education. New York: Palgrave Macmillan. Government Document Larsen, K., Bandara, D. C., Esham, M., & Unantenne, R. (2016). Promoting University-Industry Collaboration in Sri Lanka: Status, Case Studies, and Policy Options (Directions in Development). In Document Martin, M. (2000). Managing University-Industry Relations: A Study of Institutional Practices from 12 Different Countries. Working document in the series: Improving the Managerial Effectiveness of Higher Education Institutions. International Institute for Educational Planning/ UNESCO, Paris.	Fernandez, R. (2015). Statement of the Relationship Report 2015: Collaboration Between Universities and Business in the UK. UK: National Centre for Universities and Business. 100 pages.	Government
Hakins, J.N. and Mok, K.H. (2015). Research, Development, and Innovation in Asia Pacific Higher Education. New York: Palgrave Macmillan. Government Document Larsen, K., Bandara, D. C., Esham, M., & Unantenne, R. (2016). Promoting University-Industry Collaboration in Sri Lanka: Status, Case Studies, and Policy Options (Directions in Development). In The World Bank Publication. Available at: https://doi.org/10.1596/978-1-4648-0922-4_ch1. Martin, M. (2000). Managing University-Industry Relations: A Study of Institutional Practices from 12 Different Countries. Working document in the series: Improving the Managerial Effectiveness of Higher Education Institutions. International Institute for Educational Planning/ UNESCO, Paris. Document		Document
Hakins, J.N. and Mok, K.H. (2015). Research, Development, and Innovation in Asia Pacific Higher Education. New York: Palgrave Macmillan. Government Document Larsen, K., Bandara, D. C., Esham, M., & Unantenne, R. (2016). Promoting University-Industry Collaboration in Sri Lanka: Status, Case Studies, and Policy Options (Directions in Development). In The World Bank Publication. Available at: https://doi.org/10.1596/978-1-4648-0922-4_ch1. Martin, M. (2000). Managing University-Industry Relations: A Study of Institutional Practices from 12 Different Countries. Working document in the series: Improving the Managerial Effectiveness of Higher Education Institutions. International Institute for Educational Planning/ UNESCO, Paris. Document	Guimón, J. (2013). Promoting university-industry collaboration in developing countries. World Bank, 3, 12-48.	Government
Larsen, K., Bandara, D. C., Esham, M., & Unantenne, R. (2016). Promoting University-Industry Collaboration in Sri Lanka: Status, Case Studies, and Policy Options (Directions in Development). In The World Bank Publication. Available at: https://doi.org/10.1596/978-1-4648-0922-4_ch1. Martin, M. (2000). Managing University-Industry Relations: A Study of Institutional Practices from 12 Different Countries. Working document in the series: Improving the Managerial Effectiveness of Higher Education Institutions. International Institute for Educational Planning/ UNESCO, Paris. Document		Document
Larsen, K., Bandara, D. C., Esham, M., & Unantenne, R. (2016). Promoting University-Industry Collaboration in Sri Lanka: Status, Case Studies, and Policy Options (Directions in Development). In The World Bank Publication. Available at: https://doi.org/10.1596/978-1-4648-0922-4_ch1. Martin, M. (2000). Managing University-Industry Relations: A Study of Institutional Practices from 12 Different Countries. Working document in the series: Improving the Managerial Effectiveness of Higher Education Institutions. International Institute for Educational Planning/ UNESCO, Paris. Document	Hakins, J.N. and Mok, K.H. (2015). Research, Development, and Innovation in Asia Pacific Higher Education. New York: Palgrave Macmillan.	Government
Larsen, K., Bandara, D. C., Esham, M., & Unantenne, R. (2016). Promoting University-Industry Collaboration in Sri Lanka: Status, Case Studies, and Policy Options (Directions in Development). In The World Bank Publication. Available at: https://doi.org/10.1596/978-1-4648-0922-4_ch1. Martin, M. (2000). Managing University-Industry Relations: A Study of Institutional Practices from 12 Different Countries. Working document in the series: Improving the Managerial Effectiveness of Higher Education Institutions. International Institute for Educational Planning/ UNESCO, Paris.		
The World Bank Publication. Available at: https://doi.org/10.1596/978-1-4648-0922-4_ch1. Martin, M. (2000). Managing University-Industry Relations: A Study of Institutional Practices from 12 Different Countries. Working document in the series: Improving the Managerial Effectiveness of Higher Education Institutions. International Institute for Educational Planning/ UNESCO, Paris. Document	Larsen, K., Bandara, D. C., Esham, M., & Unantenne, R. (2016). Promoting University-Industry Collaboration in Sri Lanka: Status, Case Studies, and Policy Options (Directions in Development). In	Government
Martin, M. (2000). Managing University-Industry Relations: A Study of Institutional Practices from 12 Different Countries. Working document in the series: Improving the Managerial Effectiveness of Higher Education Institutions. International Institute for Educational Planning/ UNESCO, Paris.		
of Higher Education Institutions. International Institute for Educational Planning/ UNESCO, Paris.		Government
	Marc Foni S. K. and Gunasekera. R. (2016). Fiscal Disaster Risk Assessment and Risk Financing Options. Sri Lanka.	Government

Document

Mendes, P. 2014. Integrating Intellectual Property into Innovation Policy Formulation in Sri Lanka. Geneva: World Intellectual Property Organization.	Government
	Document
Ministry of Science Technology and Research. (2008). National science and technology policy. Available at: http://www.nastec.gov.lk/files/policy_reports/national_science_technology_	Governmen
policy of sri lanka english.pdf, accessed on 14/03/2021	Document
Ministry of Science Technology and Research. (2010). Science, Technology and Innovation Strategy for Sri Lanka, 2011 to 2015. Available at: http://costi.gov.lk/index.php/en/.	Governmen
	Document
Stein, S. and Walch, C. (2017). The Sendai Framework for Disaster Risk Reduction as a Tool for Conflict Prevention. SSRC/ Conflict Prevention and Peace Forum.	Governmen
	Document
United Nations. (n.d.). Sendai Framework for Disaster Risk Reduction 2015-2030. Available at: http://www.unisdr.org/files/43291_sendaiframeworkfordrren.pdf.	Governmen
	Document
University Grants Commission of Sri Lanka. (2016). University Grants Commission of Sri Lanka. Commission Circular No. 10/2016 Available at: https://www.ugc.ac.lk/attachments/17	Governmen
14 Comm.%20Circular%2010 2016.pdf, accessed on 04/05/2021	Document
Wilson, T. (2012). A Review of Business—University Collaboration. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/32383/12-610-wilson-review-business-university-collaboration.pdf.	Government Document
United Nations. (2008). Private Sector Activities in Disaster Risk Reduction: Good Practices and Lessons Learned. Available at: https://www.unisdr.org/2006/ppew/PPP-bestpractices.pdf	Governmen
	Document
Caseiro, N., and Santos, D. (2019). Smart Specialization Strategies and the Role of Entrepreneurial Universities. USA: IGI Global.	Book
	Chapter
Etzkowitz, H. and Zhou, C. (2017). The Triple Helix: University-Industry-Government Innovation and Entrepreneurship. US: Routledge.	Book
	Chapter
Lao, R. (2015). A Critical Study of Thailand's Higher Education Reforms: The culture of borrowing. New York: Routledge.	Book
	Chapter
University Grants Commission of Sri Lanka (2017 and 2020). University Statistics Book. Sri Lanka	Book
	Chapter
Weerasinghe K.D.N., Pushpitha N.P.G. (2020) Cinnamon Process Technology. In: Senaratne R., Pathirana R. (eds) Cinnamon. Springer, Cham, 233-250. Available at: https://doi.org/10.1007/978-3-	Book
<u>030-54426-3_9</u>	Chapter
Wissema, J.G. (2009). Towards the third generation university: Managing the university in transition. Cheltenham: Edward Elgar Publishing. 272 pages.	Book
	Chapter
Chantanusornsiri, W. (2019). R&I upgrades key rating for Thailand. Bangkok Post Online. 2 November 2019. Available at: https://www.bangkokpost.com/business/1785319/ri-upgrades-key-rating-for-thailand .	Website
Elsevier. (2021). University-industry collaboration: a closer look for research leaders. Available at: https://www.elsevier.com/research-intelligence/university-industry-collaboration.	Website
Engineering Design Center – University of Peradeniya. (n.d.). Engineering Design Center. Available at: http://eng.pdn.ac.lk/pages/Centers/edc/	Website
Engineering Technology Incubation Center - University of Peradeniya. (n.d.). ENGINEERING TECHNOLOGY INCUBATION CENTRE. Available at: http://eng.pdn.ac.lk/etic/	Website
James, F. (2020). How to Build University Partnerships for Climate Action. QS Online. Available at: https://www.qs.com/how-to-build-university-partnerships-for-climate-action/.	Website
Venturewell. (2019). Industry and University Collaboration: How Partnership drives Innovation. Available at: https://venturewell.org/industry-and-university-collaboration/.	Website
http://adapt.eng.ku.ac.th/cc/	Website
https://ec.europa.eu/programmes/erasmus-plus/node_en	Website
https://www.cmu.ac.th/	Website

tps://www.nrct.go.th/	Website
tps://www.nstda.or.th/home/	Website
ps://www.nu.ac.th/	Website
ps://www.scopus.com/	Website
ps://www.tci-thaijo.org/	Website
tps://www.tsri.or.th/	Website
tp://www.web.msu.ac.th/	Website
https://www.web.msu.ac.th/ https://www.web.msu.ac.th/	